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Illustrative Approaches to Operationalize the FOMC's Policy Normalization Principles and Plans Around the Time of Liftoff[1]

1. Introduction

Recent FOMC communications have outlined high-level "principles and plans" for implementing monetary policy during normalization.[2] In short, these plans envision the interest rate on excess reserves (IOER) as the primary tool the Federal Reserve will employ to move the federal funds rate into the target range established by the FOMC. Overnight reverse repurchase agreement operations (ON RRPs) and other supplementary tools will be used as needed to help control the federal funds rate. To date, however, the Committee has not articulated a detailed plan describing how it intends to employ these various tools at the time of liftoff. With liftoff likely to occur sometime this year—conceivably as soon as April, according to the Chair's recent press conference remarks—this memo sketches some possible operational approaches to liftoff as a means of facilitating Committee discussion of these issues at coming meetings.

Much of the discussion below is premised on the view that uncertainties regarding policy normalization are likely to be most pronounced at the time of liftoff. Moreover, public focus on the efficacy of the Federal Reserve's policy normalization tools and tactics is also likely to be especially intense at the time of liftoff. The key consideration posed below is: *In developing a detailed approach for liftoff, how should policymakers balance the goal of achieving a high degree of certainty that liftoff will proceed smoothly from the start with concerns about the costs associated with the tools, including risks to financial stability and the structure of financial intermediation?* In addressing this basic issue, policymakers may judge that heightened uncertainties at the time of liftoff warrant taking an operational approach that *temporarily* increases the Federal Reserve's exposure to costs and risks associated with the policy tools, reducing that exposure once liftoff is successfully underway.

Staff has gained additional insights from recent testing of the Federal Reserve's policy tools that can be used to inform the further calibration of the liftoff approach. Below we review the key lessons learned from the testing that has been conducted to date and then describe two basic approaches that the FOMC might employ, in light of the testing, to help ensure that liftoff will successfully move the federal funds rate into the desired range from the outset. These two approaches are intended to help illustrate key issues and foster discussion. Of course, policymakers may wish to consider some alternative approaches, and we also discuss a few such possibilities and touch on some considerations regarding FOMC communications. We conclude by highlighting the key tradeoffs between the basic approaches and posing a few key questions for policymakers' consideration.

Importantly, our discussion focuses on ways in which policymakers might want to enhance *ex ante* confidence—both their own and that of market participants—in a smooth liftoff. A mix of policy tools

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[2] The Federal Reserve's "Policy Normalization Principles and Plans" are included as an appendix to this memo.

could, in addition, be deployed *ex post* if liftoff should not proceed as smoothly as desired at the start, as described in a recent memo to the FOMC.[3] A drawback of relying only on *ex post* adjustments is that it could take some time to decide, communicate, and implement the preferred policy adjustments, and the resulting lag could affect perceptions of the Federal Reserve's effectiveness or credibility.

2. Lessons Learned from Recent Testing

The recent rounds of testing of overnight and term RRP operations and the Term Deposit Facility (TDF) have provided valuable insights into how these tools could work together at the time of liftoff.

RRP testing. Overall, the results of the Federal Reserve's testing of RRP operations over the past year suggest three main takeaways.[4] First, certainty of availability matters—that is, the perceived adequacy of investment capacity plays a critical role in the effectiveness of ON RRP operations in establishing a soft floor on money market rates. In particular, to support short-term interest rates effectively, the ON RRP facility needs to be viewed by market participants as being a consistently available investment alternative, one that will not be frequently capped in practice. For example, when the per-counterparty bid limit on ON RRPs was raised to $10 billion in April 2014—a time when there was no aggregate cap on take-up—the ON RRP operations started to put a soft floor on money market rates, even amid a significant paydown in Treasury bills during that tax season. Market participants apparently viewed the new individual bid limit as unlikely to be binding for most ON RRP counterparties, providing a credible threat in their rate and quantity negotiations, or stated differently, helping to establish the ON RRP rate as a key "opportunity cost" in their investment decisions. By contrast, when the aggregate capacity of ON RRP operations was subsequently limited to $300 billion in aggregate—an amount that was in fact binding on the September quarter end—most money market rates began to decline in advance of the quarter-end date and then move back up afterwards, when the capacity cap was no longer binding. Consistent with the importance of availability, when aggregate RRP capacity was increased to $600 billion over the December year-end date—using, for the first time, a combination of $300 billion in ON RRPs and $300 billion of term RRPs—money market rates stayed at or above the ON RRP rate across the year-end date, as cash lenders apparently viewed such capacity as providing sufficient certainty of availability of ON RRPs to enable effective negotiations with their counterparties.

Second, term RRPs appear to be a valuable complement to the Federal Reserve's offering of capped ON RRPs. In particular, when both ON and term RRPs are made available, institutions appear to engage in substitution between the two offerings to some extent, reducing their take-up of the ON operations perhaps to earn a "term premium" over the expected ON stop-out rates over the term. As such, at a likely small incremental cost for the Federal Reserve, term RRP operations appear useful for mitigating the possible risks of a destabilizing surge in take-up of ON RRPs. Thus, through the use of term RRPs, policymakers seem able to exploit a tradeoff, at least to some degree, between using term RRPs and

[3] See the memo "Policy Actions that Could be Taken if Interest Rate Control is Insufficient Under the Baseline Approach to Policy Normalization" sent to the Committee on September 5, 2014, for a discussion of the FOMC's options to improve the smoothness of lift of *ex post*.

[4] For a more detailed discussion of quarter-end money market dynamics in September 2014, see the memo "Testing of Reverse Repos: Assessment to Date and Possible Further Steps" sent to the Committee on October 24, 2014; a forthcoming memo to the Committee will contain a more detailed discussion of December 2014 year-end money market dynamics and an assessment of the term RRP tests.

lifting the aggregate cap on ON RRPs—that is, if policymakers choose to rely more on term RRPs, the ON RRP cap would likely not need to be as high. By contrast, if policymakers choose to raise the cap on ON RRPs by a greater amount, they would likely need to rely on term RRPs less. Indeed, in principle, one could imagine using term RRPs in high enough quantities that it may not be necessary to increase the cap on the ON RRP facility to gain considerable confidence that a smooth liftoff can be achieved. Alternatively, one could imagine increasing the cap on the ON RRP facility enough that term RRPs would be unnecessary to ensure a smooth liftoff.

Third, when the cap on the ON RRP facility is likely to bind, term RRP operations appear to support short-term interest rates. By design, the series of term operations allowed market participants to learn something about year-end demand for investment opportunities ahead of the year-end date, giving them time to adjust their investment plans, if necessary. Moreover, some market contacts indicated that the level of support of short-term market rates across year-end was particularly strong, as the final two term RRP operations were undersubscribed and the stop-out rate of 10 basis points was a level slightly "above market" at the time.[5]

While the term RRP operations conducted in December appeared to provide market participants with an effective substitute for additional ON RRP operations and contributed to a smooth year-end in money markets, such test operations do not illustrate all of the trade-offs associated with their use. For example, while term RRPs offer financial stability benefits relative to ON RRPs, the Federal Reserve has less experience operating them in size.[6] And relative to ON RRPs, term RRPs are more complex in their operational design. For example, the timing of the term offerings might need to be tailored to a calendar liftoff date to have good benefit, and the maximum rates and offering sizes associated with term operations would need to be carefully set in relation to the overnight operations. Moreover, there may be some limit to the willingness of market participants to substitute term RRPs for ON RRPs. If policymakers were interested in taking an approach to liftoff that relied heavily on term operations, additional testing ahead of liftoff would be needed to gain further practice with this type of operation.[7]

TDF testing. The results of the TDF test operations conducted to date have provided some insight into banks' demand for term deposits. In general, take-up, or the lack thereof, of term deposits has mainly been influenced by banks' compositional cash management decisions, rather than by banks' seeking to boost their interest income. For example, the introduction of the early withdrawal option last fall, one which allowed banks to include TDF investments as high-quality liquid assets in the calculation of their Basel III Liquidity Coverage Ratios, led to significant increases in the number of participants and take-up at TDF operations relative to the operations conducted earlier in the year. While an offer rate of even 1 basis point above the IOER rate generated more than $100 billion in take-up at the TDF operations, and raising the offer rate further generally resulted in increased take-up, the amounts taken up varied from

[5] Data on triparty Treasury repo transactions show that on the days of each of the final two term RRP operations, the stop-out rate in the Federal Reserve's term RRP operation was around the trade-weighted average rate prevailing in the market for repos of similar tenors.
[6] Note that prior to the financial crisis, the Desk occasionally used small overnight RRP operations to help manage the level of reserves in order to influence trading in the federal funds market.
[7] A forthcoming memo to the Committee will discuss options for further testing of the Committee's policy tools.

operation to operation in only a moderate range. However, some banks reportedly continued to be limited by the maximum individual award amount, even after it was raised in the fall tests. Not unexpectedly, the limited scale of the TDF tests has not produced sufficient scarcity of reserves to put upward pressure on money market rates. Nevertheless, there are other channels through which TDFs may provide support over time. In that regard, overall, staff has concluded that the TDF may be helpful in a supporting role after liftoff, if needed, or to provide additional reinforcement at liftoff if policymakers desire a "belt and suspenders" type approach.[8]

General test results. Testing has also demonstrated that market participants need time to adjust their investment decisions in light of changes to the Federal Reserve's offerings. Indeed, market participants were reportedly surprised by the changes to the ON RRP exercise announced after the September FOMC meeting, about two weeks ahead of being effective, apparently amplifying the downward pressure on rates at the subsequent quarter-end. Lead time would seem to be especially important for term RRPs and the TDF because term funding decisions probably require more staging by market participants than overnight decisions. This suggests that if the FOMC wants to support a successful liftoff by enacting changes to its investment facilities, particularly its term offerings, at the time of liftoff, some form of advance communication with market participants will be crucial to ensuring that the full benefits of the changes may be realized quickly.

3. Two Illustrative Operational Approaches to Liftoff

In this section we describe two broad approaches that could help to ensure that liftoff will proceed smoothly. The options discussed here are intended to illustrate some of the key issues that policymakers may wish to consider in finalizing the details of their approach for liftoff; as noted above, other applications of the Committee's principles and plans could conceivably be feasible and effective for ensuring a smooth liftoff, including offering different total amounts of RRPs. Overall, the options discussed below need not be viewed or communicated as being permanent features of the Federal Reserve's policy implementation plans. Instead they could be viewed and communicated as being special calibrations of the Committee's normalization principles and plans to be used at the time of liftoff, perhaps lasting only a few weeks, and then further adjustments could be made. The Committee may want to consider further testing that would be useful in elaborating a view about these approaches.

Under both illustrative options, summarized in the table below, the IOER and ON RRP rates would be set identically—the IOER rate would be set at the top of the target range for the federal funds rate and the ON RRP rate would be set at the bottom of the target range, as was described in the minutes of the July FOMC meeting.[9] Each option would also employ both ON and term RRPs. In particular, each option would raise the aggregate cap on ON RRPs from its current test-phase level, at least for a time, and also incorporate the use of term RRPs in some fashion to support short-term market rates.

[8] For a more complete review of the most recent TDF testing, see the memo "Recent Testing of the Term Deposit Facility" sent to the Committee on December 5, 2014.
[9] A variant in which the ON RRP rate is set just above the bottom of the target range is discussed in the next section.

Two illustrative operational approaches to liftoff

Calibration	Option 1	Option 2
IOER rate	top of target range	
ON RRP rate	bottom of target range	
Cap on ON RRPs	$600 billion	$400 billion
Use of term RRPs	if needed, ramp up after liftoff	in advance + ramp up

Option 1. Under the first basic approach, the FOMC would rely primarily on ON RRPs as a supporting policy tool. For this tool to provide effective support for short-term interest rates, market participants would require sufficient assurance that the aggregate cap on ON RRPs would not be binding except maybe in exceptional circumstances, for example to limit disruptive surges or at quarter-ends. While the aggregate bid for ON RRPs so far has consistently been below the $300 billion cap except at quarter ends, the demand for ON RRPs could increase once short-term interest rates begin to rise.[10] To provide effective headroom while accounting for the possibility of such shifts in investors' preferences, including those that might result from unforeseen developments, the aggregate cap on ON RRPs would be increased to a significant extent, at least for a while, such as to a level of at least $600 billion, the total amount of RRPs authorized by the FOMC for year-end operations. Further adjustments to the level of the cap could be made, either up or down, based on the experience gained in the process of normalization and the possible subsequent deployment of supplementary tools.

In addition, in option 1 the FOMC would stand prepared to conduct term RRP operations after liftoff. In particular, the FOMC could announce in advance its intention to conduct term RRP operations in sizable quantities after liftoff if money market rates did not increase sufficiently. Such term operations could be needed if spare capacity at the ON RRP operations turned out to be insufficient, or if the cap on ON RRPs turned out to bind. Absent an upward adjustment in the cap on ON RRPs, an increase in the size of term RRP operations at such a time would be expected to lower the quantity of ON RRPs demanded and help to firm rates. Various circumstances could give rise to use of term RRPs under option 1 after liftoff—for example, if demand for ON RRPs turns out to be greater than expected for unforeseen reasons. More likely, usage of term RRPs could be needed at predictable times when cash lenders tend to face diminished investment opportunities and money market rates tend to soften, such as at quarter-ends and perhaps also around the April personal income tax date. In general, however, staff presumes that the likelihood that term RRPs might be needed would decrease the higher the level of the cap on ON RRPs is set.

[10] Investors' preferences for ON RRPs could shift once interest rates begin to rise. For example, the opportunity cost of leaving money uninvested would increase with market interest rates, potentially leading cash lenders to seek to increase their use of the facility. Moreover, historically at least, deposit rate levels tend to lag increases in the federal funds rate and short-term market interest rates. If that were also the case in the coming rising rate environment, one in which the ON RRP rate would adjust upward in lock-step with the target federal funds rate, the preference of cash investors such as money funds for ON RRPs relative to deposits could increase.

Compared to a cap of $300 billion, option 1 would give policymakers greater confidence that liftoff would proceed smoothly. If the aggregate cap on ON RRPs is set at a level at which it is not expected to bind, policymakers could have a high degree of confidence that ON RRP operations will establish a floor on the level of short-term interest rates at liftoff. Moreover, the advance notice that the FOMC stands ready to also employ term RRP operations should help to remove any remaining uncertainty that the ON RRP cap might persistently bind around the time of liftoff and may also independently put some upward pressure on short-term market rates.

Some policymakers have expressed concerns about having a higher aggregate cap on ON RRPs, even for a time, because doing so could entail risks to financial stability and because financial markets could potentially be altered by the Federal Reserve's increased footprint.[11] Concerns regarding financial stability should be mitigated, at least to some extent, by the fact that the increase in the cap would only be temporary and would occur at a time when disruptive flight to quality flows are unlikely. If such concerns were not sufficiently mitigated by those qualifications, a dynamic cap on ON RRPs could be adopted in order to prevent any significant surges in take-up, such as was described in a previous FOMC memo.[12] Concerns about increasing the Federal Reserve's footprint in financial markets may also be relatively modest if the increase in the ON RRP cap were viewed as only temporary and clear criteria were introduced for reductions in the size of the cap.[13] Indeed, there is now considerable anecdotal evidence suggesting that market participants are actively maintaining their existing counterparty relationships because they anticipate that the facility will be discontinued when it is no longer needed to support money market rates.

The length of time that the cap on ON RRPs would need to remain elevated will depend on conditions in money markets observed only after liftoff. If take-up in ON RRP operations does not increase substantially upon liftoff, or did so only for a short while, the cap could be lowered back to its current level relatively quickly. Alternatively, if take-up is persistently higher than policymakers desire, elevated ON RRP operations might be used only as a bridge until term RRPs can be ramped up. In either case, the elevated cap could be used solely as a temporary measure in the days or weeks immediately following liftoff. If additional measures were needed to reduce the demand for ON RRPs, one or more administered rates could also be adjusted to widen the spread between the IOER and ON RRP rates, and the TDF might possibly be introduced.

As noted above, because market participants need time to adjust their investment decisions in light of changes to the Federal Reserve's offerings, some time may be necessary to ramp up usage of term RRPs enough to effectively support market interest rates under option 1, if needed. This may particularly be the case under option 1 because the term offerings would not already be in effect in some form at the time of

[11] See the memo "Further Planning for Conducting Monetary Policy during the Normalization Period" sent to the Committee on June 6, 2014 for a discussion of how the costs and risks associated with various Federal Reserve policy tools might be taken account of in formulating a strategy for liftoff.
[12] See the memo "Addressing Financial Stability Concerns Associated with an ON RRP Facility: Design Features and Other Mitigants" sent to the Committee on June 6, 2014, for a discussion of the dynamic cap that could be used to limit surges of take-up of ON RRPs.
[13] Such criteria would provide transparency to market participants regarding the timing of potential cap reductions.

liftoff.[14] And, given that term RRPs would only be offered if liftoff does not proceed sufficiently smoothly, the parameter settings and size of such operations may be hard to calibrate; if not set properly, some additional undesired volatility in money markets could result. In particular, while the Desk could, in principle, set a higher-than-expected maximum bid rate on term operations to stimulate greater participation, such actions could have disruptive effects on the term structure of money market rates.

Option 2. Under this option the FOMC would rely more heavily on the use of term RRPs as a supporting policy tool at liftoff to help mitigate the undesirable risks to financial stability of having a larger ON RRP program. Further, because an increase in take-up of term RRPs may take some time to achieve, the FOMC would conduct term RRP operations in advance of liftoff, in relatively small size, and aim to quickly ramp up the size of those operations after liftoff as necessary. To the extent that there is some substitution between ON and term RRPs, having some funds locked up at the term facility at the time of liftoff would, all else equal, leave more headroom at the ON RRP facility at liftoff, increasing market confidence that the ON RRP cap would not bind and, thereby, helping to support its effectiveness at liftoff. Moreover, having term operations ongoing at the time of liftoff would presumably enable them to be more quickly scaled up after the announcement of policy tightening, compared to a situation in which term RRPs were not already in operation.[15] In addition, the longer that term RRPs are operated ahead of liftoff the more comfortable the Desk may generally become in operating them, experience that could be useful if circumstances prove difficult at liftoff.

Advance term operations could be designed in several ways. One approach would be to put term operations in place only around particular calendar events associated with money market pressures such as quarter-ends, and possibly also around the April personal income tax date. An alternative approach would be to conduct term operations continuously, in the spirit of prudent testing, with offering amounts increasing around times of predictable pressures in money markets. While advance operations of any type would allow the Federal Reserve to gain additional experience with this tool, that gain might be maximized by using continuous term operations; such operations could start relatively soon, and continue until liftoff. In addition, some policymakers may prefer to put term operations in place continuously to reduce complications or signaling associated with their scheduling, particularly if liftoff does not occur close to a quarter-end.[16] Either way, the term RRPs could be ramped up after liftoff through more frequent or larger operations or higher maximum bid rates.

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[14] The December 2014 term RRP testing provides a little insight into the helpfulness of lead time. In that case, the FOMC announced on October 29 their intention to conduct term RRPs over year-end "in December," and then announced a schedule of term RRPs on December 1, the first offering of which, conducted one week later, was oversubscribed at $50 billion.

[15] Large increases in term RRP over a short period of time are presumably harder for market participants to prepare for than a more regular program. Having a base of term RRPs already in place would allow the Desk to conduct operations on dates that had already been scheduled and known to market participants, albeit in larger amounts.

[16] If liftoff does not occur close to a quarter-end, continuous term operations would provide a pre-arranged opportunity to have a base level of term RRPs in place at the time of liftoff. For example, the second day of the June FOMC meeting will fall on the 17th, when quarter-end pressures are not typically evident. In addition, if the FOMC described their use of term RRPs in advance of liftoff as being tied to alleviating pressures in short-term money markets, market participants might expect such usage to occur in earnest only around discrete events such as quarter-ends or tax time, which may not line up well with the FOMC's underlying intention to use the tool relatively intensively at liftoff.

With a heavier reliance on term RRPs going into liftoff, by design, the aggregate cap on ON RRP operations would not need to be as high as in option 1. Nevertheless, the cap could be temporarily increased somewhat in order to provide greater certainty that liftoff will proceed smoothly, perhaps to a level of $400 billion, which approximates the maximum aggregate bid for ON RRPs observed to date. In addition, market participants presumably would adjust their investment strategies to take account of a growing book of term RRPs as the Federal Reserve ramps it up, and the use of term RRPs may provide an additional clear signal to market participants that the FOMC does not intend to permanently increase the ON RRP cap.

Policymakers interested in increasing their *ex ante* confidence in a smooth liftoff might like option 2 because greater use of term RRPs in some form should help ensure that the aggregate cap on ON RRPs would not bind, even if it is increased by only a relatively small amount at liftoff. Moreover, relative to option 1, the more modest increase in the ON RRP cap may help to alleviate concerns about risks to financial stability or risks that providing large amounts of "deposit-like" investment opportunities to nonbanks would encourage growth in this sector at the expense of regulated depository institutions.

However, there may be some drawbacks to this option. As was the case for option 1, it may prove difficult to ramp up term RRPs very quickly after liftoff even though in this case the operations would not start from zero; market participants would likely still need a bit of time to adjust their demand for the Federal Reserve's term offerings.[17] That said, the more term RRPs are already outstanding going into liftoff, the smaller the need for heavy post-liftoff term operations is likely to be because existing investments in pre-liftoff term operations would leave more headroom under the cap on ON RRPs. This option is likely to be somewhat more expensive than option 1, with the cost differential tied to the degree to which term RRP rates are set higher than the ON RRP rate as well as the size of ongoing operations. In addition, the use of term RRP operations in advance of liftoff may create some communications challenges for the FOMC. As noted above, to help counteract this concern, the Committee could conduct the advance operations continuously. Another drawback to conducting term operations in advance of liftoff is that, to the extent that operating in term markets may raise some operational complexities, some policymakers may prefer to rely on term operations only to the extent that their objectives cannot be achieved through overnight operations.

Overall, under either option, because the Desk and the market have less experience with large-quantity term RRPs, additional testing would be recommended to allow for some learning and adjustments to the operations' settings before liftoff. To the extent that policymakers wanted to avoid the possibility of fluctuations in term rates at the onset of liftoff, they may favor having a relatively high cap on ON RRPs in place at that time, as in option 1.

Of course, depending on policymakers' desire for *ex ante* certainty of liftoff, the FOMC could decide to combine the elements of options 1 and 2, such as electing to lift off with a substantially higher ON RRP cap together with a program of term RRPs already underway. Or the Committee could decide to adopt an

[17] The amount of time that market participants may need to absorb an increase in the scale of existing term offerings is difficult to gauge.

alternative approach to the options presented above, the subject of the next section.

4. Alternative Approaches

The options presented above illustrated two possible arrangements for using ON and term RRPs to increase the Committee's *ex ante* confidence in a smooth liftoff. Of course, the normalization principles and plans do not rule out using other elements from the package of policy tools at liftoff or choosing different levels of intensity of their use at liftoff. Below we consider a few alternative approaches to operationalize the Committee's high-level liftoff strategy that could also make policymakers more confident that liftoff will proceed smoothly.

Narrowing the initial IOER–ON RRP rate spread. As in the July 2014 minutes, the options discussed above envision setting the IOER rate at the top of the target range for the federal funds rate and the ON RRP rate at the bottom of the range, discussed at that time in reference to a target range of 25 basis points for the federal funds target rate. Those settings were motivated by a desire to foster conditions that would preserve trading in the federal funds market and also keep the ON RRP program to a manageable size. Recent testing has suggested that the volume of trading in the funds market and take-up at ON RRP operations are not likely to be especially sensitive to small variations in the spread between the IOER and ON RRP rates.[18] Testing has also indicated that increases in the ON RRP rate may result in a truncation of the lower tail of unsecured rates.[19] In light of this experience, policymakers may wish to consider a somewhat narrower initial setting of this spread. For example, as is the case now, the ON RRP rate might be maintained at 5 bps above the lower end of the target range at liftoff, or even slightly higher as in the recent ON RRP rate test. A slightly smaller spread likely would provide greater confidence that the funds rate will be in its target range than would be the case with the ON RRP rate set at the bottom of the target range.

Adjusting administered rates in parallel. Policymakers may prefer to set the spread between the ON RRP and IOER rates at 25 basis points at liftoff, in line with the target range for the federal funds rate, but nevertheless believe that a modest upward adjustment of the level of ON RRP and IOER rates relative to the target range would make a smooth liftoff more likely. In such a case, the first increase of the target range, presumably to 25-to-50 basis points, could be accompanied by an increase of the ON RRP and IOER rates to 30 and 55 basis points, respectively. The slightly higher settings of these administered rates relative to the federal funds target range might help to keep the federal funds rate in the target range.

Using the TDF. The Federal Reserve could also employ TDF operations at or before liftoff to put additional upward pressure on rates. For example, the Federal Reserve could offer ongoing term deposits at 5 basis points over IOER. As noted above, recent testing has suggested that demand is only somewhat rate sensitive and an early withdrawal option is critical for robust take-up. Though testing has not proven

[18] In early December 2014, the ON RRP rate was set at 10 basis points for two weeks while the IOER rate remained at 25 basis points. Volume in the federal funds market remained roughly unchanged immediately before, during, and after this 15 basis point IOER–ON RRP rate spread testing period. Also, in late December 2014, term RRP operations stopped out at 10 basis points with unused capacity, likewise leaving volume in the federal funds market roughly unchanged.

[19] See the memo "Assessment of Changes to Reverse Repo Testing" sent to the Committee on December 5, 2014, for more discussion.

that take-up to date has been large enough to be a significant factor affecting money market rates, over time, such operations could help to put upward pressure on short-term market rates as depository institutions take advantage of the facility to arbitrage private-sector deposit rates or as reserves come to be drained in sufficient quantities, through this facility or in tandem with other tools.

5. Communications

The FOMC's policy normalization principles and plans provided a high-level summary of the approach the FOMC anticipates taking when it becomes appropriate to begin normalizing the stance of monetary policy. As the FOMC calibrates its plans, it may be desirable to provide additional information in advance to the public about its approach, regardless of the way in which the FOMC chooses to lift off. By communicating in advance some information regarding how it is thinking about using an ON RRP facility at the time of liftoff, as well as if and how other policy tools are expected to be used at liftoff, the Committee can remove uncertainty among market participants regarding whether the ON RRP cap is expected to bind. Advance communication can also allow time for market participants to adjust their investment decisions according to the approach the FOMC chooses to pursue, which should aid in a smooth liftoff.

A summary of the discussion about liftoff options in the minutes of upcoming meetings will be helpful in disseminating the information. Closer to the time of liftoff, such discussions could be more detailed and amplified in the press conference remarks by the Chair or in speeches and testimonies. Through these measures, the FOMC can share information in a timely manner while also creating an opportunity to receive feedback as it refines its liftoff plans.

6. Conclusions and Key Questions for Policymakers

Policymakers may want to increase the likelihood that liftoff occurs as smoothly as possible when the time comes. Informed by the lessons that have been learned to date from testing the Federal Reserve's policy tools, this memo sketched out two possible ways to achieve such an outcome that are consistent with the FOMC's communications to date. Under the first approach, the cap on the ON RRP facility would be temporarily increased to a larger extent and usage of term RRPs at the time of liftoff would likely not be needed. Under the second approach, term RRPs would play a more important role and the cap on the ON RRP facility would not need to be increased as much. Some variants of these two basic approaches were also discussed, and others could conceivably also be effective.

The two illustrative options were designed to highlight some important trade-offs for policymakers to consider. The best way to provide the greatest certainty of a smooth liftoff might be to rely heavily on ON RRPs—temporarily raise the cap on ON RRPs by a large amount and use term RRPs only if needed. As the focus of this approach would be on overnight rates, it may be seen as being relatively easy to communicate and implement operationally. Of course, such an approach would entail increased exposure to the footprint and financial stability risks associated with ON RRPs, although such exposure would be only temporary. However, a key issue is whether policymakers are willing to raise the cap on ON RRPs by a sufficiently large amount. If not, the Committee might either need to turn quickly to term RRPs after liftoff, which might be difficult to orchestrate appropriately in the event, or plan instead to shift some interactions with extended counterparties from ON to term operations ahead of liftoff, as in the second option discussed above. By having some term operations underway at the time of liftoff and ramping them up after liftoff, the second option would likely reduce the need to raise the cap on ON RRPs, thereby alleviating some of the concerns related to the potential for sizable flight-to-quality flows associated with larger overnight operations. Such an approach would also provide the FOMC with two RRP-related levers to influence interest rates at liftoff, a time when uncertainty about interest rate control may be the greatest. Of course, in addition to the term RRP rates, term operation sizes and dates would also have to be maintained appropriately, adding to the complexity of operations and communications precisely when it will be crucial to handle these things effectively.

Overall, in considering whether and how to increase certainty of liftoff, policymakers may wish to discuss the following three questions:

1. How should greater *ex ante* certainty of a smooth liftoff be balanced with concerns regarding the potential size of an ON RRP program or more aggressive use of other policy tools?
2. What are your general views of the options presented in the memo?
    a. Would a significant temporary increase in the ON RRP cap at the time of liftoff be desirable?
    b. Would conducting term RRPs in size either in advance of liftoff or immediately thereafter be attractive?
    c. Are other possible adjustments discussed in the memo attractive, such as narrowing the spread of IOER to the ON RRP rate, adjusting the IOER and ON RRP rates relative to the target range for the federal funds rate, or making use of term deposits?
3. Are there any other steps that you think should be taken to support a smooth liftoff?

Appendix

Release Date: September 17, 2014

Policy Normalization Principles and Plans

During its recent meetings, the Federal Open Market Committee (FOMC) discussed ways to normalize the stance of monetary policy and the Federal Reserve's securities holdings. The discussions were part of prudent planning and do not imply that normalization will necessarily begin soon. The Committee continues to judge that many of the normalization principles that it adopted in June 2011 remain applicable. However, in light of the changes in the System Open Market Account (SOMA) portfolio since 2011 and enhancements in the tools the Committee will have available to implement policy during normalization, the Committee has concluded that some aspects of the eventual normalization process will likely differ from those specified earlier. The Committee also has agreed that it is appropriate at this time to provide additional information regarding its normalization plans. All FOMC participants but one agreed on the following key elements of the approach they intend to implement when it becomes appropriate to begin normalizing the stance of monetary policy:

- The Committee will determine the timing and pace of policy normalization--meaning steps to raise the federal funds rate and other short-term interest rates to more normal levels and to reduce the Federal Reserve's securities holdings--so as to promote its statutory mandate of maximum employment and price stability.
    - When economic conditions and the economic outlook warrant a less accommodative monetary policy, the Committee will raise its target range for the federal funds rate.
    - During normalization, the Federal Reserve intends to move the federal funds rate into the target range set by the FOMC primarily by adjusting the interest rate it pays on excess reserve balances.
    - During normalization, the Federal Reserve intends to use an overnight reverse repurchase agreement facility and other supplementary tools as needed to help control the federal funds rate. The Committee will use an overnight reverse repurchase agreement facility only to the extent necessary and will phase it out when it is no longer needed to help control the federal funds rate.
- The Committee intends to reduce the Federal Reserve's securities holdings in a gradual and predictable manner primarily by ceasing to reinvest repayments of principal on securities held in the SOMA.
    - The Committee expects to cease or commence phasing out reinvestments after it begins increasing the target range for the federal funds rate; the timing will depend on how economic and financial conditions and the economic outlook evolve.
    - The Committee currently does not anticipate selling agency mortgage-backed securities as part of the normalization process, although limited sales might be warranted in the longer run to reduce or eliminate residual holdings. The timing and pace of any sales would be communicated to the public in advance.
- The Committee intends that the Federal Reserve will, in the longer run, hold no more securities than necessary to implement monetary policy efficiently and effectively, and that it will hold primarily Treasury securities, thereby minimizing the effect of Federal Reserve holdings on the allocation of credit across sectors of the economy.
- The Committee is prepared to adjust the details of its approach to policy normalization in light of economic and financial developments.