Normalizing Monetary Policy

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The views expressed in this presentation reflect the author’s and do not necessarily reflect that of the Federal Reserve Bank of New York or the Federal Reserve System.
Disclaimer

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Agenda

- Section 1: The Markets Group at the New York Fed
- Section 2: Unconventional Policy & the Fed’s Portfolio
- Section 3: Money Markets
- Section 4: Normalizing Monetary Policy
Section 1: The Markets Group at the New York Fed
Preamble to the Federal Reserve Act

“Act to provide for the establishment of Federal Reserve banks, to furnish an elastic currency, to afford means of rediscounting commercial paper, to establish a more effective supervision of banking in the United States, and for other purposes”
Federal Reserve History

- The Federal Reserve was created to “solve a currency problem”
  - The supply of currency did not expand and contract with the needs of the economy/financial system

- The Federal Reserve Act of 1913
  - 12 Federal Reserve Banks created to manage money supply

- Banking Act of 1933 (revised 1935) formed the Federal Open Market Committee (FOMC)
  - A new government agency to direct open market operations for the Federal Reserve system
    - The 7 members of the Board of Governors
    - The President of the FRBNY
    - 4 of the remaining 11 reserve bank Presidents, on a rotating basis

- Bank Holding Company Act of 1956 named the Fed the regulator of bank holding companies owning more than one bank
Functions of the Federal Reserve System

- Monetary policy goals of price stability and maximum employment
  - The longer-run inflation objective of 2 percent is deemed consistent with the Federal Reserve’s mandate
  - Assessment of the maximum level of employment is based on a wide range of indicators
- Supervise and regulate banking institutions
- Provide financial services to depository institutions, the U.S. government, and foreign official institutions
  - Payments systems – Fedwire
- More recently, a focus on maintaining stability in the financial system and containing systemic financial risks
Federal Reserve Organization

President of FRBNY

Markets Group/ SOMA Mgr.

FOMC

Member of

Members of

Gives direction to

Members of

Board of Governors

Other Reserve Bank Presidents

Discount Window and Collateral Valuation

Markets Operations, Monitoring, and Analysis

Central Bank & International Account Services

Member of Governor Members of
The Markets Group’s Mission

- Monetary policy implementation
  - Manage Federal Reserve balance sheet and execute open market operations (OMO) consistent with FOMC directives
    - Includes swap lines, exchange rate intervention, foreign reserves management

- Monitor and analyze financial market and financial stability developments

- Lender of last resort responsibilities
  - Discount Window for the 2nd District
  - Collateral valuation services for Federal Reserve Banks

- Fiscal agent support for the U.S. Treasury
  - Provide debt issuance, debt management advisory, foreign exchange services and foreign reserves management

- Account services to foreign central banks, international agencies, and U.S. government agencies
Monetary Policy Implementation

- Implement policy through domestic open market operations (OMOs)
  - FOMC votes on domestic monetary policy directive
    - Directive establishes an operating objective for OMOs
  - Desk designs and conducts OMOs to achieve the objective
    - SOMA Manager accountable to the FOMC
    - Market monitoring supports policy formulation and execution

- OMOs include
  - Repurchase agreements (RPs): temporary loans to primary dealers using all eligible securities as collateral
  - Reverse repurchase agreements (RRPs): temporary loans from primary dealers against general collateral
  - Outright transactions: permanent purchases or sales of securities
How Do We Implement Monetary Policy?

- We have 22 trading counterparties used to conduct domestic open market operations, called “primary dealers”
  - Includes banks and securities broker-dealers
  - Required to participate consistently in open market operations and provide trading desk with market information
    - Also participate in US Treasury auctions
  - Currently running a pilot program that includes smaller firms

- Also have 141 “expanded counterparties” used only for RRP operations
  - Includes banks, government-sponsored enterprises, and money market mutual funds
Section 2: Unconventional Policy & the Fed’s Portfolio
The Markets Group During the Financial Crisis

- Discount window lending to banks increased dramatically
- Designed and implemented variations on traditional “lender-of-last-resort” function
  - Auction term funds to depository institutions (TAF)
  - Lend Treasury securities from Fed’s portfolio on weekly basis (TSLF)
  - Overnight collateralized loans to primary dealers (PDCF)
  - Bilateral currency swaps with major foreign central banks
- Designed and implemented tools to support credit markets
  - Provide liquidity to U.S. issuers of commercial paper (CPFF)
  - Provide liquidity to U.S. money market investors (MMIFF)
  - Boston Fed provided liquidity to U.S. banks to finance purchases of ABCP (ABCP MMMF LF)
  - Lend to holders of consumer and small business ABS (TALF)
Large-Scale Asset Purchases as a Policy Tool

- Purchases put downward pressure on longer-term interest rates, eased financial conditions, and stimulated economic activity

- Purchases are understood to work through several channels
  - Portfolio balance effect
    - Reduce stock of securities held by private sector
    - Remove duration risk and prepayment risk from market
    - Drive risk premiums lower than they would otherwise be
  - Market functioning/liquidity effect (LSAP1)
    - Provide consistent and significant market presence
  - Signaling effect
    - May be perceived as signal of the FOMC’s intentions for the federal funds rate path
Timeline of Fed Securities Holdings & Asset Purchase Programs

$ Billions

Source: FRBNY
Evolution of the Federal Reserve’s Balance Sheet

Liabilities
- Other Liabilities
- Reserve Balances
- F.R. Notes

Assets
- Other Assets*
- MBS
- Agencies
- Treasuries

*Includes crisis facilities.

Source: Federal Reserve Board of Governors
Maturity Distribution of SOMA Treasury Holdings

Source: Federal Reserve Bank of New York
SOMA Net Income and Fed Remittances to Treasury

Source: FRBNY
### H4.1: Assets of All Federal Reserve Banks

#### 5. Consolidated Statement of Condition of All Federal Reserve Banks

**Millions of dollars**

<table>
<thead>
<tr>
<th>Assets, liabilities, and capital</th>
<th>Eliminations from</th>
<th>Wednesday April 29, 2015</th>
<th>Change since Wednesday April 22, 2015 to Wednesday April 30, 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold certificate account</td>
<td>11,037</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Special drawing rights certificate account</td>
<td>5,200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Coin</td>
<td>1,801</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Securities, unamortized premiums and discounts, repurchase agreements, and loans</td>
<td>4,397,889</td>
<td>- 18,983</td>
<td>+ 178,612</td>
</tr>
<tr>
<td>Securities held outright (1)</td>
<td>4,214,779</td>
<td>- 18,106</td>
<td>+ 187,667</td>
</tr>
<tr>
<td>U.S. Treasury securities (2)</td>
<td>2,460,034</td>
<td>+ 114</td>
<td>+ 109,762</td>
</tr>
<tr>
<td>Bills (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Notes and bonds, nominal (2)</td>
<td>2,316,709</td>
<td>0</td>
<td>+ 106,320</td>
</tr>
<tr>
<td>Notes and bonds, inflation-indexed (2)</td>
<td>98,468</td>
<td>0</td>
<td>3,079</td>
</tr>
<tr>
<td>Inflation compensation (3)</td>
<td>14,858</td>
<td>+ 115</td>
<td>+ 364</td>
</tr>
<tr>
<td>Federal agency debt securities (2)</td>
<td>35,895</td>
<td>0</td>
<td>- 9,070</td>
</tr>
<tr>
<td>Mortgage-backed securities (4)</td>
<td>1,718,850</td>
<td>- 18,220</td>
<td>+ 86,975</td>
</tr>
<tr>
<td>Unamortized premiums on securities held outright (5)</td>
<td>200,860</td>
<td>- 915</td>
<td>- 8,887</td>
</tr>
<tr>
<td>Unamortized discounts on securities held outright (5)</td>
<td>-17,811</td>
<td>+ 39</td>
<td>- 108</td>
</tr>
<tr>
<td>Repurchase agreements (6)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Loans</td>
<td>61</td>
<td>0</td>
<td>60</td>
</tr>
<tr>
<td>Net portfolio holdings of Maiden Lane LLC (7)</td>
<td>1,689</td>
<td>- 5</td>
<td>+ 35</td>
</tr>
<tr>
<td>Net portfolio holdings of Maiden Lane II LLC (8)</td>
<td>0</td>
<td>0</td>
<td>- 63</td>
</tr>
<tr>
<td>Net portfolio holdings of Maiden Lane III LLC (8)</td>
<td>0</td>
<td>0</td>
<td>- 22</td>
</tr>
<tr>
<td>Net portfolio holdings of TALF LLC (9)</td>
<td>0</td>
<td>0</td>
<td>- 92</td>
</tr>
<tr>
<td>Items in process of collection (0)</td>
<td>59</td>
<td>- 21</td>
<td>- 33</td>
</tr>
<tr>
<td>Bank premises</td>
<td>2,244</td>
<td>- 1</td>
<td>- 30</td>
</tr>
<tr>
<td>Central bank liquidity swaps (10)</td>
<td>0</td>
<td>0</td>
<td>- 300</td>
</tr>
<tr>
<td>Foreign currency denominated assets (11)</td>
<td>20,057</td>
<td>+ 557</td>
<td>- 4,168</td>
</tr>
<tr>
<td>Other assets (12)</td>
<td>31,522</td>
<td>+ 263</td>
<td>+ 1,603</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>(0)</td>
<td>4,471,499</td>
<td>- 18,196</td>
</tr>
</tbody>
</table>

**Note:** Components may not sum to totals because of rounding. Footnotes appear at the end of the table.

## H4.1: Liabilities & Equity of All Federal Reserve Banks

### 5. Consolidated Statement of Condition of All Federal Reserve Banks (continued)

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Eliminations from consolidation</th>
<th>Wednesday Apr 29, 2015</th>
<th>Change since Wednesday Apr 22, 2015 Wednesday Apr 30, 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Reserve notes, net of F.R. Bank holdings</td>
<td>1,315,983 + 945 + 87,275</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse repurchase agreements (13)</td>
<td>249,887 - 25,503 - 75,611</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deposits</td>
<td>(0) 2,839,718 + 7,379 + 161,453</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term deposits held by depository institutions</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other deposits held by depository institutions</td>
<td>2,581,067 - 36,313 + 66,629</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S. Treasury, General Account</td>
<td>245,426 + 44,353 + 97,083</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign official</td>
<td>5,233 + 2 - 2,593</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (14)</td>
<td>(0) 7,992 - 664 + 333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deferred availability cash items</td>
<td>(0) 549 - 5 - 314</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other liabilities and accrued dividends (15)</td>
<td>7,661 - 1,012 + 1,073</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total liabilities</td>
<td>(0) 4,413,797 - 18,196 + 173,875</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Capital accounts

| Capital paid in                                  | 28,851 0 + 787 |
| Surplus                                          | 28,851 0 + 787 |
| Other capital accounts                           | 0 0 0         |

**Total capital**

| 57,702                                           | 0 + 1,575       |

**Note:** Components may not sum to totals because of rounding.

Implications for Open Market Operations

- LSAPs raised new operational challenges for the Desk
  - New, more complex instruments (agency MBS)
  - Increased frequency and size of operations

- However, the fundamental approach has remained the same
  - Seek competitive pricing and cost efficiency
  - Manage risks
  - Be mindful of disruptions to financial markets
  - Be consistent, predictable, and transparent
  - Innovate and adjust operations as needed
Additional Operational Considerations

- **Market functioning**
  - Monitor effects of purchases on market conditions, results
  - Conduct securities lending and dollar rolls

- **Transparency**
  - Release planned operation schedules in advance
  - Release aggregate operational results and prices paid
  - Release summary of individual transaction details monthly
  - Release full transaction details with a 2-year lag

- **Operational risk management and resiliency**
  - Ensure robust controls
  - Provide end-to-end resiliency for mission-critical operations
SOMA Holdings as a Share of Outstanding Supply

SOMA Treasury Holdings as Share of Outstanding Supply
December 2014

SOMA Agency MBS Holdings as Share of Purchasable Universe
December 2014

Source: Federal Reserve Bank of New York
Global Asset Purchases

- Bank of Japan
  - Expanding the monetary base by ¥80 trillion rate per year since October 2014
    - Purchases include JGBs, commercial paper, corporate bonds, ETFs and JREITs
  - “Will continue with the QQE, aiming to achieve the price stability target of 2 percent, as long as it is necessary for maintaining that target in a stable manner”
  - Balance sheet is currently about 62% of GDP while securities holdings were about 41% of GDP at end-2014

- European Central Bank
  - Purchase €60 billion per month beginning in March 2015
    - Purchases will include euro-denominated sovereign bonds, ABS, and covered bonds
  - Intend to continue purchases “until end-September 2016” or in any case until “a sustained adjustment in the path of inflation” is achieved
  - Balance sheet is currently about 22% of GDP while securities holdings were only about 2% of GDP at end-2014
Section 3: Money Markets
Money Markets

- Wholesale market for low-risk, highly liquid, short term loans
  - Banks and other participants trade in excess of a trillion dollars daily

- Money market rates influence other interest rates:
  - U.S. government funding costs
  - Corporate funding costs
  - Interest rate on retail deposits

- Monetary policy is largely transmitted through money markets
  - The Federal Reserve directly changes the supply of reserves\sets administered rates to impact money market rates, thereby changing financial conditions in the real economy
    - Administered rates are expected to be used during policy normalization given the size of the Fed’s balance sheet
Money Markets

- Short-term wholesale funding markets provide financial intermediaries with funds that supplement retail deposits and long-term debt issuance.

- Motivations to borrow in funding markets:
  - To finance assets
  - To meet liquidity needs
  - Earn a spread by lending borrowed funds at a higher rate (e.g. fed funds “IOER arbitrage” trades)

- Who lends in funding markets?
  - Institutions seeking returns on their cash positions (e.g. banks, GSEs, MMMFs, Securities Lenders, corporates etc.)

- Transactions can be secured or unsecured

- Money market rates reflect short-term marginal borrowing costs, influence yields on longer-term assets (e.g. Treasury yields)
Types of Money Market Transactions

- **Unsecured** – no collateral pledged by the borrower to obtain the loan
  - Federal funds
  - Eurodollars
  - Commercial paper
  - Negotiable certificates of deposit

- **Secured** – collateral is pledged by the borrower to obtain the loan
  - Repurchase agreements (Repo markets)
Unsecured: Federal Funds

- What are Federal Funds?
  - Unsecured loans of reserve balances at Federal Reserve Banks of eligible institutions
  - Governed by the Board of Governors of the Federal Reserve System’s Regulation D (imposes reserve requirements on depository institutions)
  - Most borrow funds to leave balances at the Fed for liquidity buffers and IOER
  - **The Fed does not transact directly in the federal funds market**

- Market Participants
  - Depository Institutions, Banks, Thrifts eligible to **Lend**, **Borrow**, and receive IOER
  - Agencies & U.S. branches of FBOs eligible to **Lend**, **Borrow**, and receive IOER
  - Federal Agencies (GSEs) eligible to **Lend**
  - Government Security Dealers eligible to **Lend**

Unsecured: Other U.S. Dollar Funding Markets

- **Eurodollar deposits**: unsecured U.S. dollar deposits in a bank or bank branch outside the U.S. – frequently Cayman Islands
  - Eurodollar deposits are used to finance U.S. dollar assets held “outside” of the U.S.

- **Commercial paper**: short-term debt (<9 months) issued by both financial and non-financial institutions

- **Certificates of deposit**: term deposits placed with a depository institution with maturity profiles ranging from 7 days to 5 years
Collection of Money Market Rates

- The FRBNY collects brokered overnight federal funds transactions to calculate and publish the federal funds effective rate
  - Data collected from brokers that represent a subset of the federal funds market

- FRBNY and FR Board finalized new data collection requirements during 4Q 2013 (FR 2420)
  - Since April 2014, daily transaction is collected on federal funds, Eurodollar time deposits, and certificates of deposit (CDs) of all tenors\(^1\)
  - Data collection covers insured depository institutions with total assets of $26 billion or more, and U.S. branches and agencies of foreign banks with third party assets of $900 million or more
  - Data collected accounts for approximately 80 percent of total fed funds outstanding

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1) CD Data is expected to be reported with a 2-day lag; Fed funds and Eurodollar time deposits are reported with a 1-day lag.
FR 2420 Data Collection

- FR 2420 data can improve the process for producing the federal funds effective rate and be a more representative benchmark rate
  - Higher transactions volumes
  - Transaction level detail for better data monitoring
- FR 2420 and brokered FFER levels largely similar

FR 2420 Data Collection

- The overall distribution of rates is also quite similar
- The majority of transactions occur close to the brokered FFER
- Transactions occurring substantially away from FFER account for smaller percentage of overall volume

Source: Federal Reserve Bank of New York.
Note: FFER is the federal funds effective rate.
Secured: Repurchase Agreement (Repo)

- What is repo?
  - Economically similar to a collateralized loan
  - Sale of securities together with an agreement to buy back at a later date
  - Securities dealers finance positions, intermediate cash and securities flows (matched-book)

- Tri-party & delivery vs. payment (DVP)
  - Tri-party: settle through clearing banks
  - DVP: settle bilaterally
Secured: Repurchase Agreement (Repo)

- Primary mechanism for temporarily adding or draining reserves – indirectly affect fed funds rates
  - Repo – dealer borrows funds and pledges collateral to lender
  - Reverse Repo – dealer lends funds and receives collateral from borrower
- Rate on Fed RRP an important component of the Federal Reserve’s normalization strategy
- New York Fed has long offered foreign official accounts repo against SOMA collateral, known as the foreign RP pool
Section 4: Normalizing Monetary Policy
Reserve Balances and the Fed Funds Rate (pre-crisis)

A.
- **Demand for Balances**
- **Supply of Balances**
- Federal Funds Rate:
  - Too high
  - Target
  - Too low
- Reserve Action: NONE

B.
- **Demand for Balances**
- **Supply of Balances**
- Federal Funds Rate:
  - Too high
  - Target
  - Too low
- Reserve Action: ADD

C.
- **Demand for Balances**
- **Supply of Balances**
- Federal Funds Rate:
  - Too high
  - Target
  - Too low
- Reserve Action: DRAIN
Interest Rate Control: Pre-Crisis

Source: Federal Reserve Board of Governors, Federal Reserve Bank of New York
Difficulties of Large Reserve Balances

Reserve Balances

$ Billions

Source: Federal Reserve Board of Governors
New Tools in Large Excess Reserve Environment

- Interest on Excess Reserves (IOER)
  - Original authorization granted in 2006 to be applicable on reserve balances starting Oct 2011, accelerated to Oct 2008
  - IOER is paid to depository institutions on reserve balances in excess of the reserve requirement
  - Initially rate 0.75%, 0.25% since Dec 2008
  - Only available to depository institutions
  - Theoretically, if all money market participants had access to deposits earning this risk-free rate, this would serve as a *floor* on rates.
  - However, non-banks are large participants in the federal funds market. These include: money market mutual funds (MMMFs), Government Sponsored Enterprises (GSEs), and Federal Home Loan Banks (FHLBs)
Overnight Interest Rates

Source: Federal Reserve Bank of New York, The Depository Trust & Clearing Corporation
New Tools Focused on Draining Reserves

- **Term Deposit Facility (TDF)**
  - Offers fixed quantities of term deposits through competitive auctions
  - Only available to depository institutions
  - Does not change the size of the balance sheet, but alters the composition of liabilities by substituting reserves for TDFs

- **Term and overnight fixed-quantity Reverse Repos (RRPs)**
  - Allows the withdrawal of reserves by temporarily selling securities from the SOMA portfolio under an agreement to repurchase the securities in the future
  - Economically equivalent to a collateralized loan made to the Fed by a financial institution
  - Historically infrequently used with primary dealers. In Oct 2009, Fed announced offering RRPs to an expanded set of counterparties.
  - Small scale operational exercises of *fixed quantity* since 2009
  - Each dollar of RRPs held by counterparties reduces one-for-one reserves held by financial institutions
Overnight Reverse Repurchase Agreement Exercises

- In September 2013, the FOMC authorized a series of daily ON RRPs at a **fixed rate** with a **capped allotment** to explore whether an ON RRP facility could provide greater control over short-term interest rates by setting a floor on money market rates.
- Testing currently authorized by FOMC through January 2016.
- There are 163 eligible counterparties, including the traditional 22 primary dealers, banks, GSEs and MMMFs.
- More usage by MMMFs (cash to invest, no access to IOER).
- Increased take-up around reporting (e.g. quarter- and year-end) dates.
- Evidence of increased usage when spread to market rates narrowed.
Overnight Interest Rates

Five-day moving averages except for ON RRP offering rate.
Sources: Federal Reserve, The Depository Trust & Clearing Corporation.
Pre-test period captures rate distributions in October 2014. Test period for an ON RRP offering rate of 7 basis points was November 17 to November 28, 2014, and for a rate of 10 basis points was December 1 to December 12, 2014.
Source: Federal Reserve (FR 2420).
Term RRP Testing

- October 2014: FOMC instructed the Desk to examine how term RRP operations might work as a supplementary tool
  - Could help control the federal funds rate and reduce potential volatility in money market rates, particularly around quarter- and year-end
- Conducted 4 operations over the December 2014 year-end, with a maximum total size of $300 billion
- Conducted 3 operations over the March 2015 quarter-end, with a maximum total size of $200 billion
- January 2015: FOMC instructed the Desk to conduct operations that do not cover quarter-end, to enhance operational readiness and increase understanding of the tool
Reverse Repos Outstanding

USD, billions

ON RRPs
Term RRPs

Temporary open market operations only.
Source: FRBNY.
Normalization Strategy

- FOMC participants agreed on the following elements of the approach to normalization
  - Will raise target 25 bps range for fed funds rate when conditions warrant
    - Intends to control fed funds rate primarily using IOER at top of range
    - Intends to use ON RRP facility and other supplementary tools as necessary, offer rate at bottom of range
      - Elevates capacity of ON RRP facility at liftoff
      - Will phase out ON RRP facility when no longer needed
  - Reduce securities holdings in a gradual and predictable manner
    - Expects to cease or commence phasing out reinvestments after first increase in target range
    - Does not anticipate selling MBS
  - Will hold no more securities than necessary in the longer run; those securities will primarily be Treasuries
  - Prepared to adjust details to normalization as necessary