Economics 435
The Financial System
(11/23-30/2021)

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UW Madison
Fall 2021

Outline

- Defining Unconventional Monetary Policies
- Quantitative Easing (Technical Definition)
- Credit Easing (Technical Definition)
- Forward Guidance
- Exit from “Quantitative/Credit Easing”
- Pandemic Return to Unconventional Monetary Policies

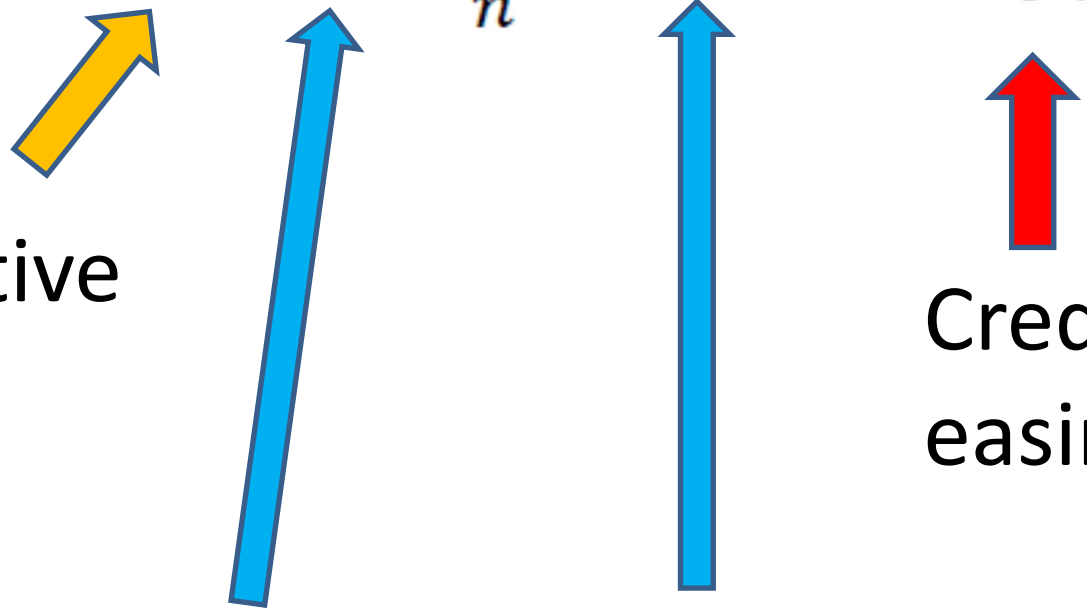
Defining Unconventional Monetary Policies

Unconventional Monetary Policy (UMP)

- Most central banks set a target for the overnight interbank lending rate.
- However there are two circumstances when additional policy tools can play a useful stabilization role:
  1. When lowering the target interest-rate to zero is not sufficient to stimulate the economy; and
  2. When an impaired financial system prevents conventional interest-rate policy from supporting the economy.

Interpreting UMP

$$i_{nt} = \frac{(i_{1t} + i^{e}_{1t+1} + \ldots + i^{e}_{1t+n-1})}{n} + tp_{nt}$$



Quantitative easing

Forward guidance

Credit easing

Unconventional Policy Tools

1. A policy duration commitment.
   - This is when the central bank promises to keep interest rates low in the future.
2. Quantitative easing (QE).
   - When the central bank supplies aggregate reserves beyond the quantity needed to lower the policy rate to zero.
3. Credit easing (CE).
   - When the central bank alters the mix of assets it holds on its balance sheet in order to change their relative prices in a way that stimulates economic activity.

Quantitative Easing

Interpreting QE

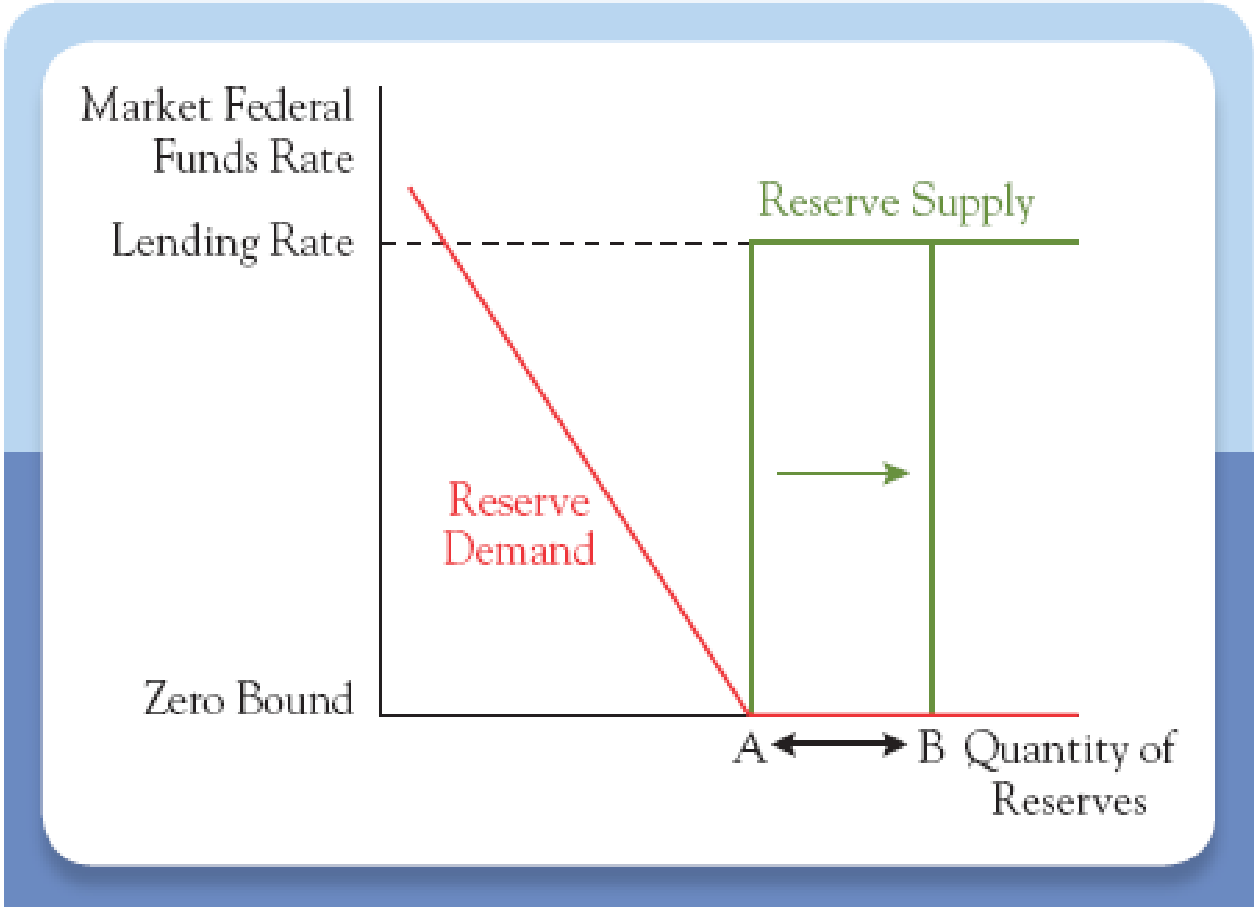
$$i_{nt} = \frac{(i_{1t} + i^{e}_{1t+1} + \ldots + i^{e}_{1t+n-1})}{n} + tp_{nt}$$

Quantitative easing

Quantitative Easing

- At a rate of zero, banks hold cash rather than lend.
- The Fed can add limitlessly to reserves without affecting the market federal funds rate.
- QE is the difference between A and B.

Figure 18.10 Quantitative Easing

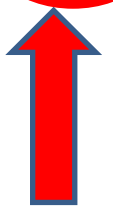


Quantitative Easing

- It is difficult to predict the effects of QE.
- Our limited experience means that we have little data on which to base such a forecast.
- Moreover, the mechanism by which QE affects economic prospects is not clear.
- An increase in the supply of reserves (QE) may simply lead banks to hold more of them rather than provide additional loans.

Interpreting Credit Easing

$$i_{nt} = \frac{(i_{1t} + i^{e}_{1t+1} + \ldots + i^{e}_{1t+n-1})}{n} + tp_{nt}$$



Credit easing

Credit Easing

Credit Easing

- *Credit easing* (CE) shifts the *composition* of the balance sheet away from risk-free assets and toward risky assets.
- The central bank's actions can influence both the cost and availability of credit, changing spreads
- In the absence of private demand for the risky asset, the central bank's purchase makes credit available where none existed.
- Impact:
  - To be greater in thin, illiquid markets.
  - To be larger the bigger the difference between the yield on the asset that the central bank buys and the yield on the asset that the central bank sells.

Credit Easing

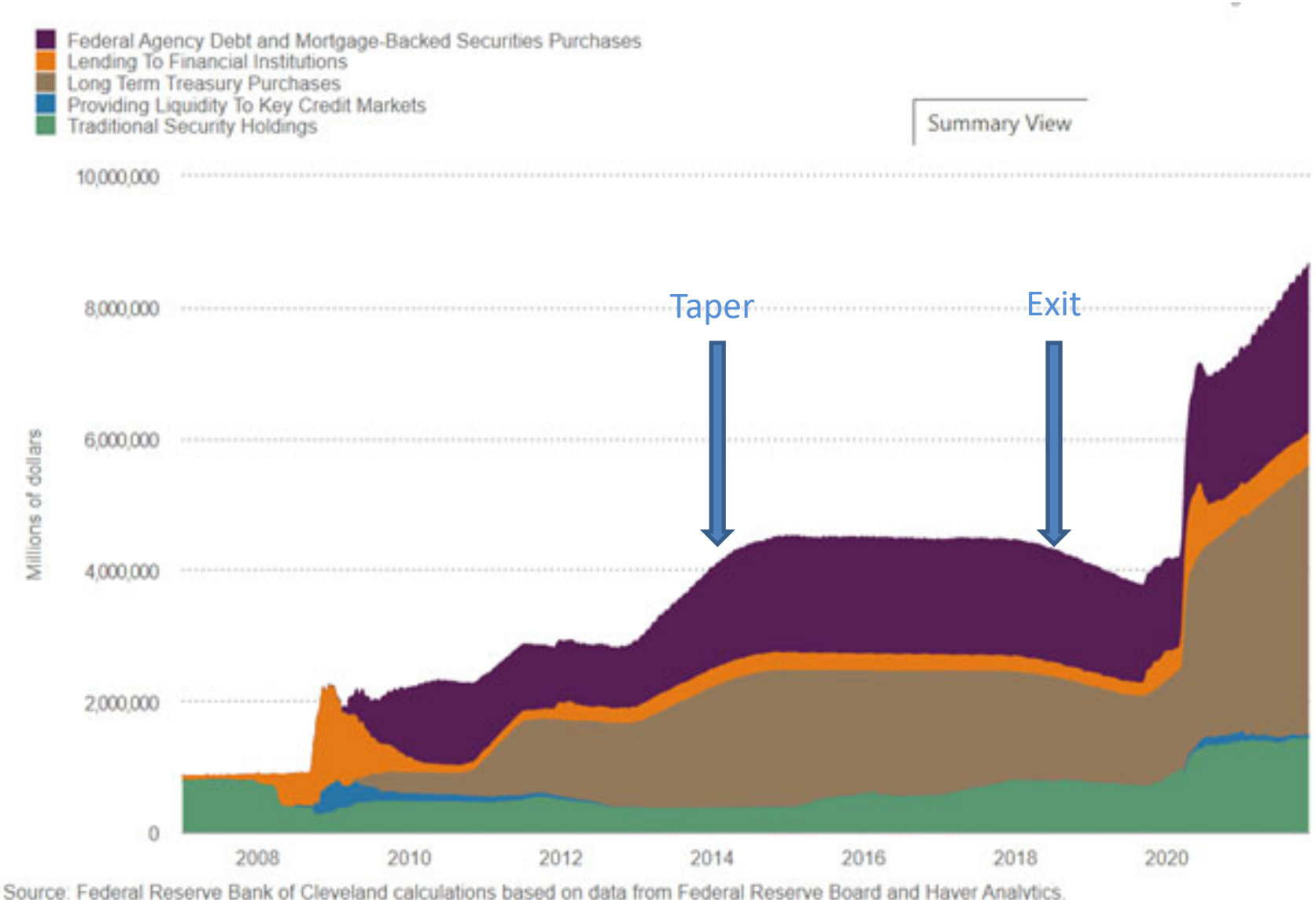
Table 1

Characteristics of the Four Asset Purchase Programs

Program	*Dates*	*Assets purchased*	*Size (billions)*	*Sterilized?*
First LSAP (QE1)	11/2008 to 3/2009	Agency debt	$200	No
		Agency MBSs	$1,250	
		Treasuries	$300	
Second LSAP (QE2)	11/2010 to 6/2011	Longer-dated Treasuries	$600	No
MEP ("Twist")	9/2011 to 12/2012	6- to 30-year Treasuries	$667	Yes
Third LSAP (QE3)	9/2012 to 10/2014	MBSs	$40/month	No
	12/2012 to 10/2014	Longer-dated Treasuries	$45/month	

Note: Quantitative easing refers to a set of four asset purchase programs: the three Large-Scale Asset Purchases (LSAPs), commonly known as QE1, QE2, and QE3; and the Maturity Extension Program (MEP), also known as the second "Operation Twist." The table summarizes the key features of these programs. MBSs are mortgage-backed securities.

Kuttner (2018).



Source: Cleveland Fed https://www.clevelandfed.org/our-research/indicators-and-data/credit-easing.aspx

Credit Easing

- CE purposely deviates from such *asset neutrality* in order to influence relative prices.
- Exiting from CE probably is also more difficult than unwinding QE.
- Risky assets are generally harder to sell than Treasuries.
  - The central bank may not be able to get rid of them exactly when it wants.
  - Political influences can become important if the Fed is hindered from selling specific assets for fear of raising the costs of a particular class of borrowers.

Estimated Impact (I)

Table 2

Estimated Event-Study Interest Rate Effects

Study	*Window (days)*	*Yield on:*	*QE1 (basis points)*	*QE2 (basis points)*	*MEP (basis points)*	*QE3 (basis points)*
Gagnon, Raskin, Remache, and Sack (2011)	1	T10	–91***			
		Agency	–156***			
		MBS	–113***			
Krishnamurthy and Vissing-Jorgenson (2011)	2	T10	–107*	–30***		
		Agency	–200***	–29***		
		MBS	–88	–13**		
Ehlers (2012)	1	T10		–14	–27***	
	2	T10		–40***	–46***	
Bauer and Neely (2014)	1	T10	–123**	–23		–14

Notes: "T10" refers to the 10-year Treasury, MBS to the 15-year Agency mortgage-backed securities, and "Agency" to the debt issued by Ginnie Mae, Fannie Mae, and/or Freddie Mac. QE1, QE2, and QE3 are three quantitative easing programs. MEP is the Maturity Extension Program. Asterisks indicate the magnitude of the ratio of the observed event-day relative to the standard deviation of the yield changes at the indicated horizon, as reported by the authors:

***denotes ratios greater than 2.58 in absolute value (1 percent tail),

**ratios greater than 1.96 (5 percent tail), and

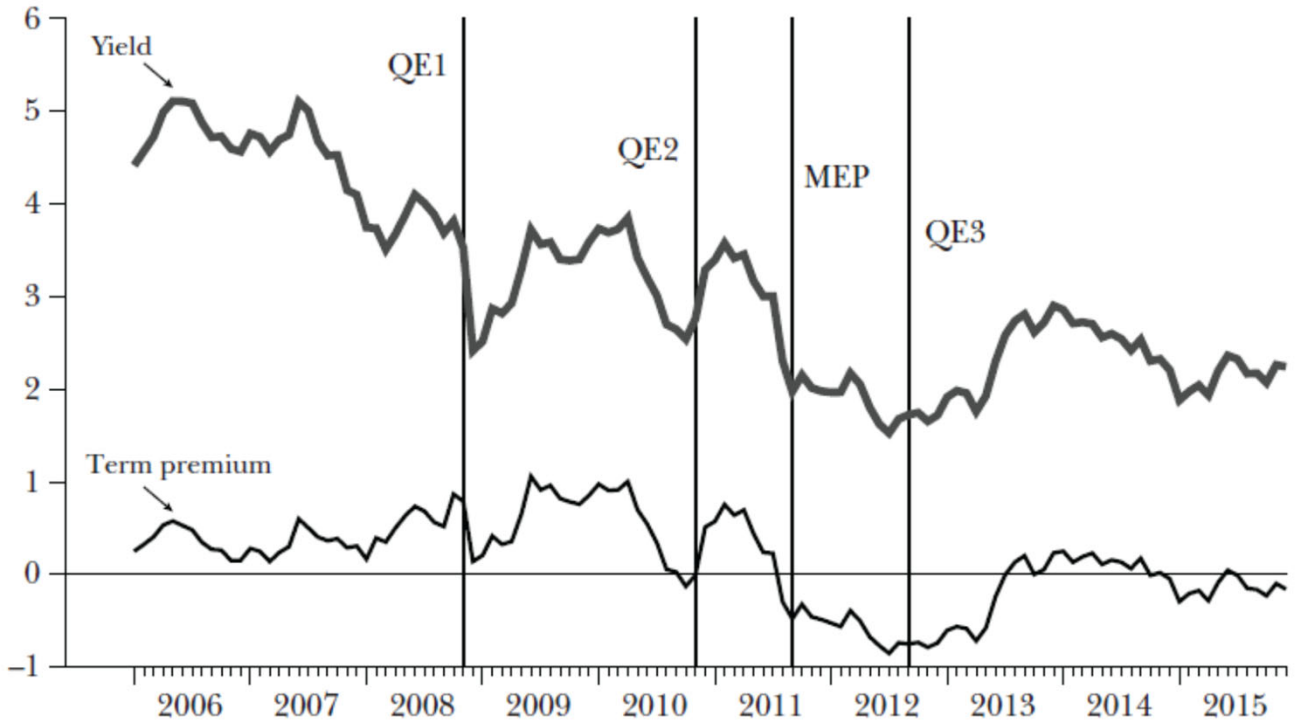
*greater than 1.69 (10 percent tail).

Estimated Impact (II)

Figure 2

Kim–Wright Estimated 10-year Term Premium and 10-year Treasury Yield

(percent)



Note: QE1, QE2, and QE3 are three quantitative easing programs. MEP is the Maturity Extension Program.

Estimated Impact (II)

Table 3

Estimated Effects of Quantitative Easing on 10-year Term Premiums

(basis points)

Study	*QE1*	*QE2*	*MEP*	*QE3*
Gagnon, Raskin, Remache & Sack (2011)	–38[a]			
D'Amico, English, López-Salido & Nelson (2012)	–35	–45		
Ihrig, Klee, Li, Schulte & Wei (2012)	–40	–40	–17	–50[b]
Hamilton & Wu (2012)			–27[c]	

Notes: QE1, QE2, and QE3 are three quantitative easing programs. MEP is the Maturity Extension Program.

[a] The smallest of the range of estimates reported.

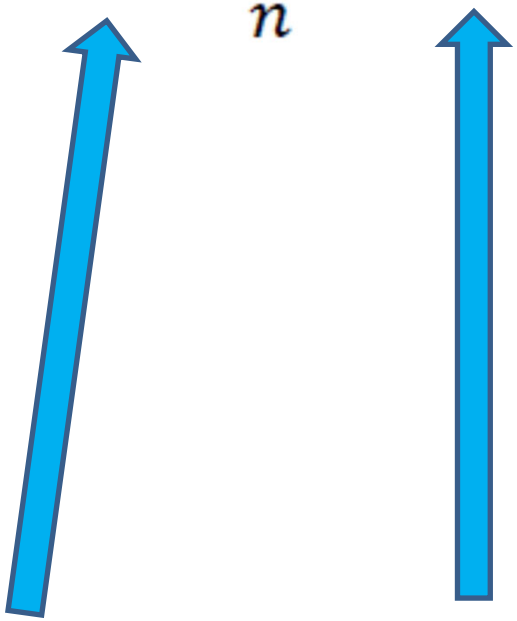
[b] Estimated by Engen, Laubach, and Reifschneider (2015) using the Ihrig, Klee, Li, Schulte, and Wei (2012) model.

[c] The reported impact of a $400 billion maturity swap, scaled up to the $667 billion size of the Maturity Extension Program.

Forward Guidance

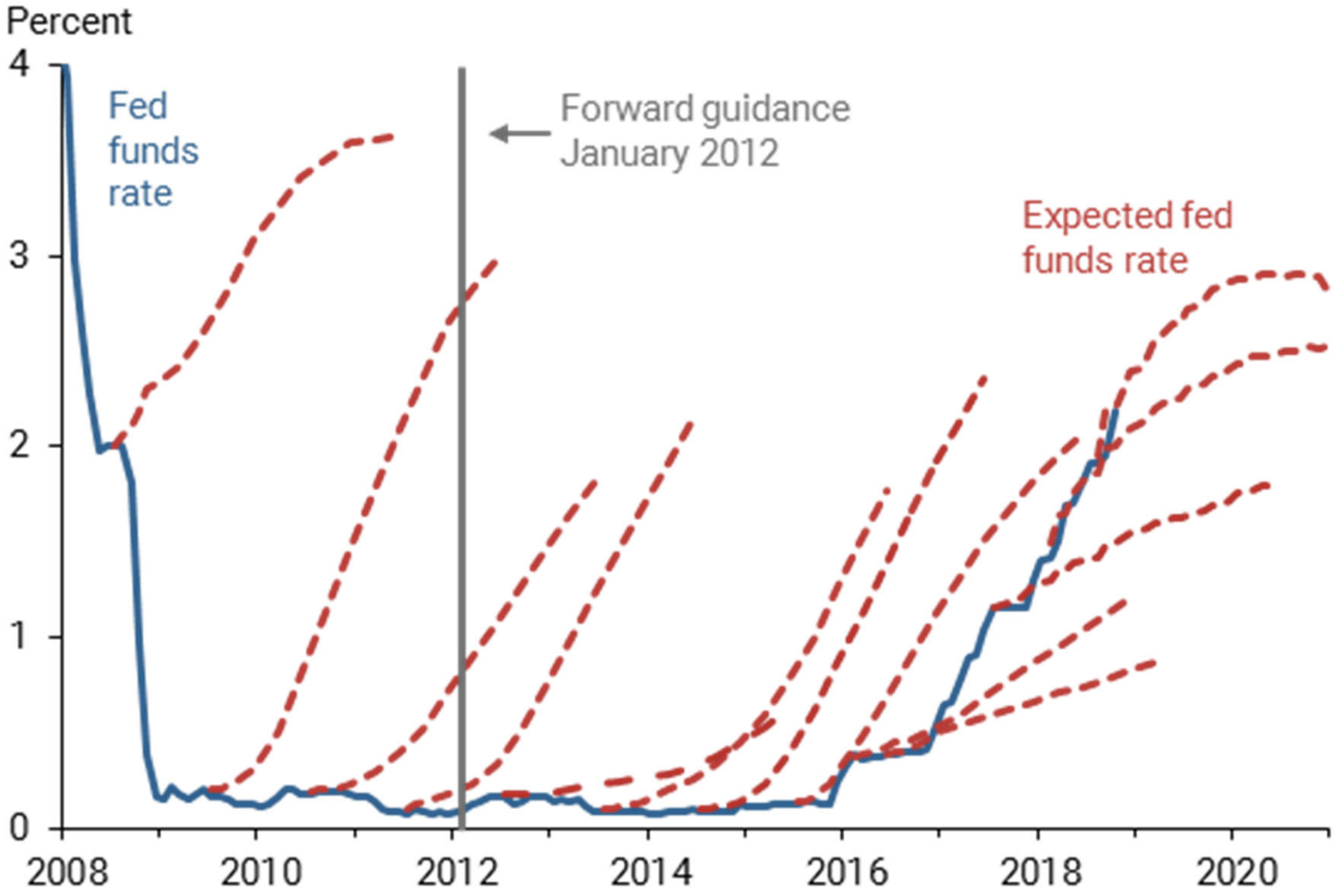
Interpreting Forward Guidance

$$i_{nt} = \frac{(i_{1t} + i^{e}_{1t+1} + \ldots + i^{e}_{1t+n-1})}{n} + tp_{nt}$$



Forward guidance

a.k.a. “Policy Duration Commitment”



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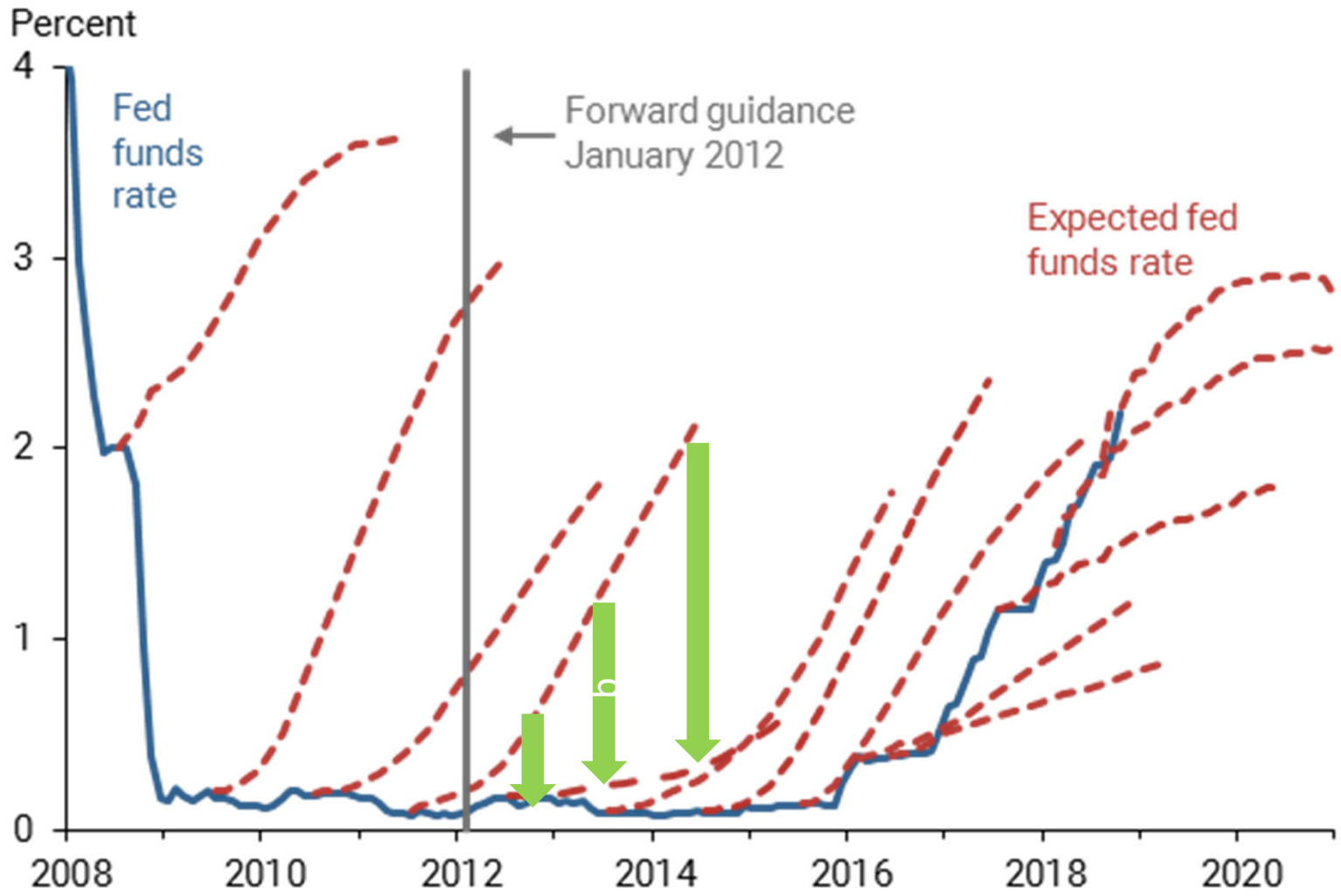


Exiting from Unconventional Monetary Policies

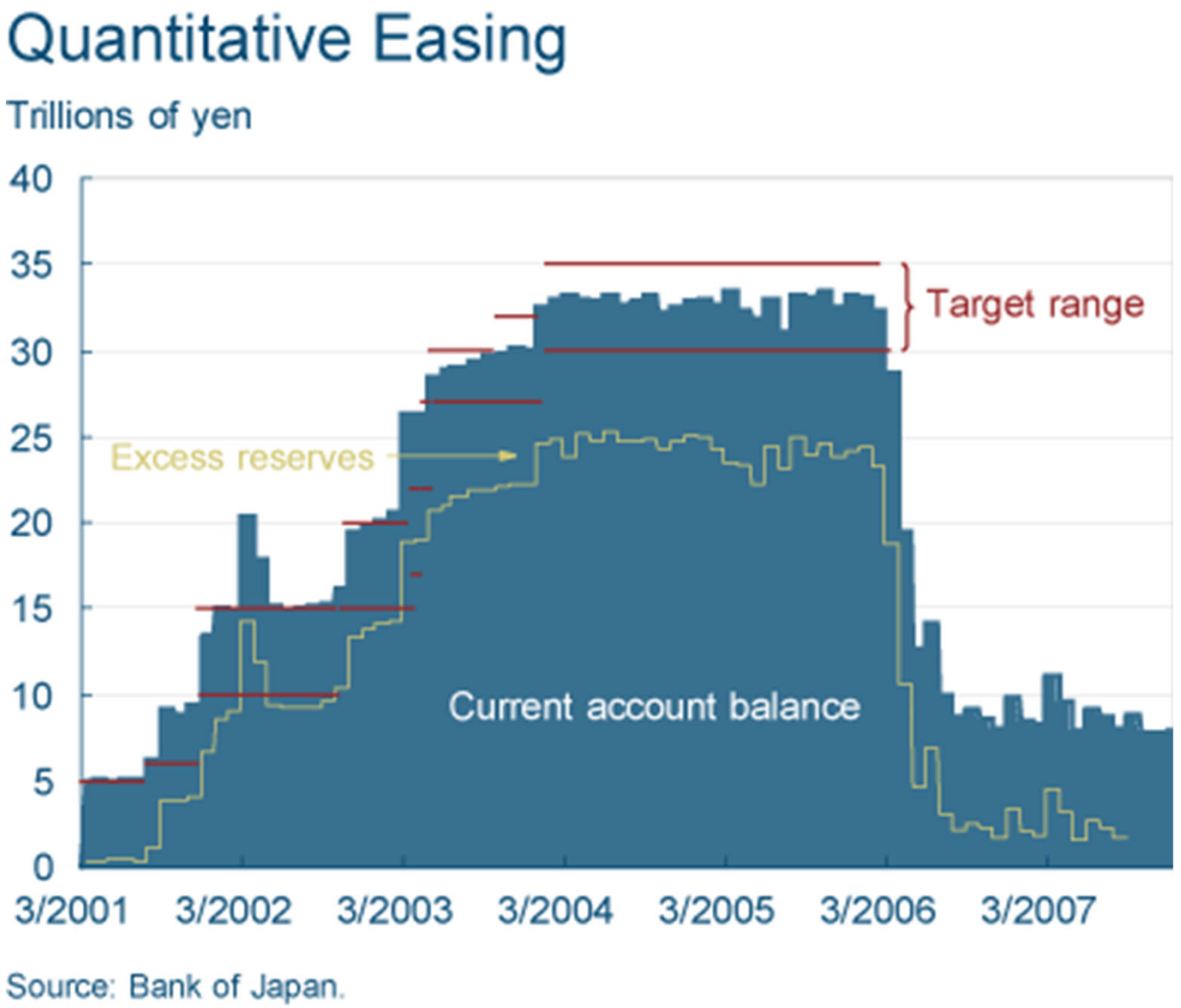
Making an Effective Exit

- Exiting from QE and CE poses additional obstacles that appear technical but have important implications.
- The question is whether a central bank that wishes to raise interest rates will be able to do so as quickly as desired.
- The answer depends on the size and composition of the central bank's balance sheet and the toolset available.

Making an Effective Exit

- What happens with QE and CE have vastly expanded the amount of reserves and assets on the central bank's balance sheet?
  - The central bank may need to sell a large volume of assets to reduce reserve supply sufficiently to raise the policy rate target.
- But, QE and CE assets are typically more difficult to sell.

The Japanese Exit



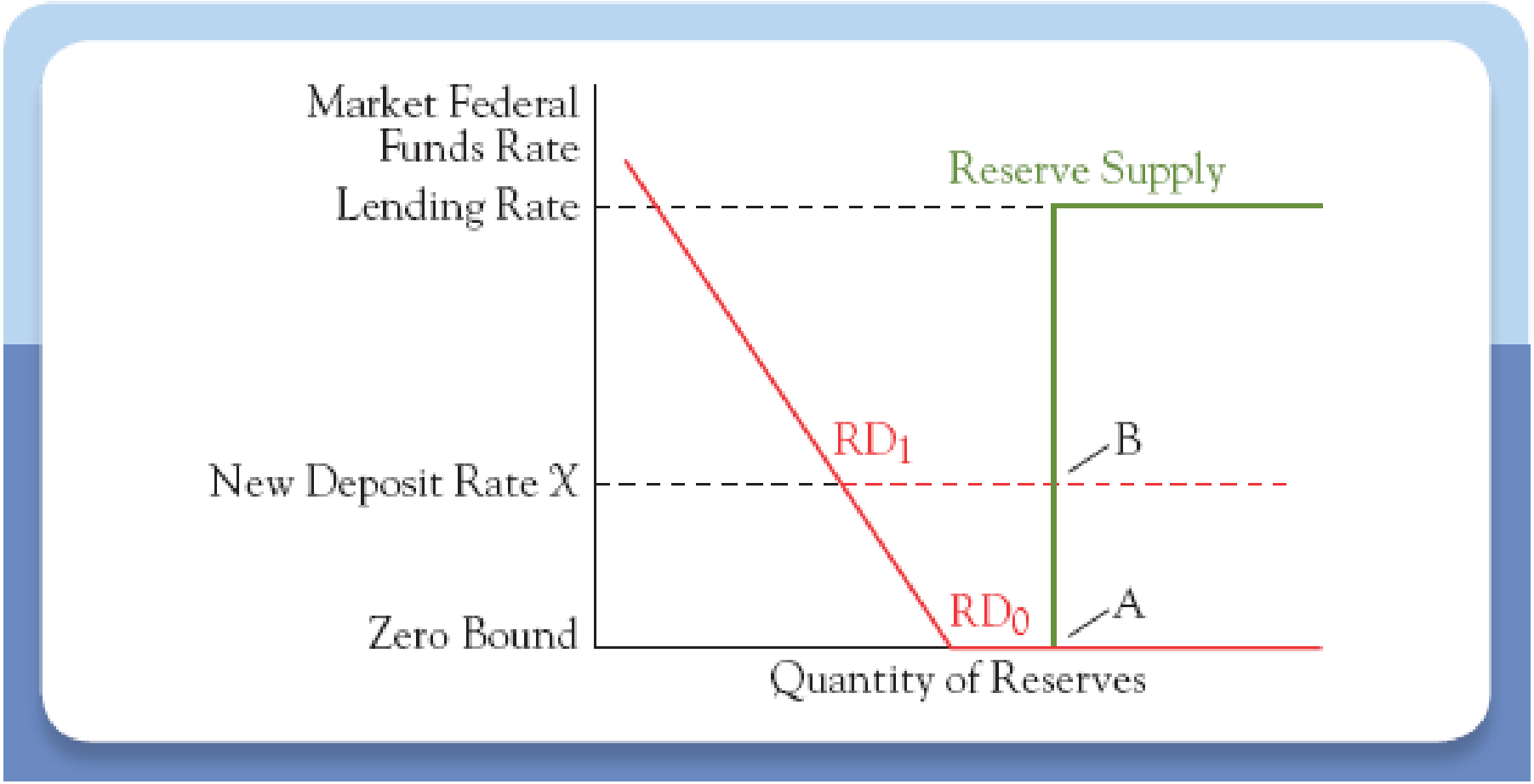
Source: Humpage and Schenk, "Japan's Quantitative Easing Policy," Economic Trends, Cleveland Fed 12/10/2008
http://www.clevelandfed.org/research/trends/2008/1208/01intmar.cfm

Making an Effective Exit

- A central bank may be unable to sell assets and withdraw reserves from the banking system rapidly enough to hike the policy interest rate when it desires.
- However, Central banks like the Fed have several policy options that allow them to tighten without having to sell their assets.
- Raising (deposit) rate on reserves.

Making an Effective Exit by Raising the Interest Rate on Reserves

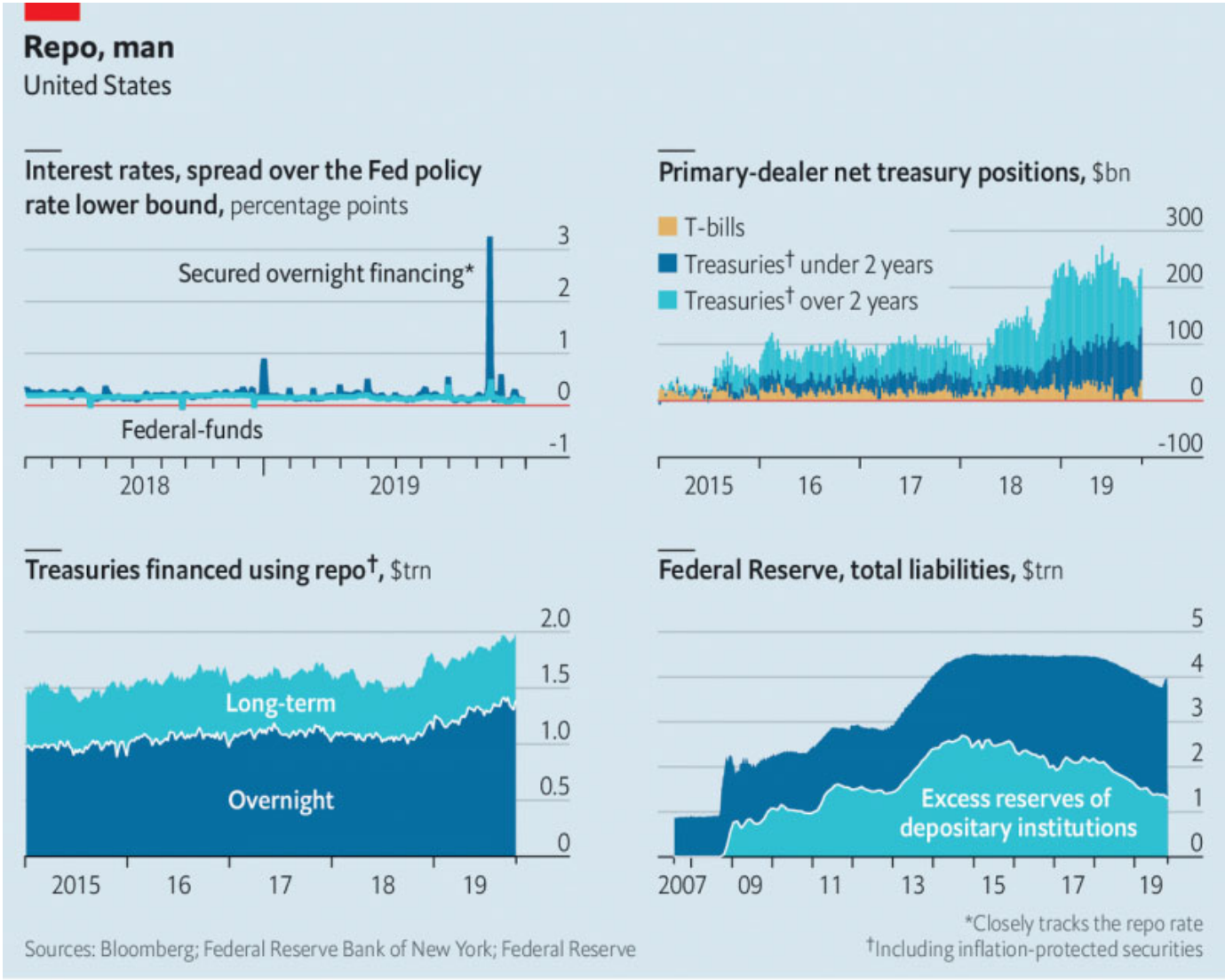
Figure 18.11 Exiting Quantitative Easing by Hiking the Deposit Rate



Making an Effective Exit

- Paying interest on reserves allows a central bank to use two powerful policy tools independently of one another:
  1. It can adjust the target rate for interbank loans without changing the size or composition of its balance sheet, and
  2. It can adjust the size and composition of its balance sheet without changing the target interest rate for interbank loans.
- This means the central bank can change its balance sheet in a fashion consistent with financial stability and keep inflation under control.
- It can avoid a fire sale by simply raising the deposit rate that they pay on reserves.

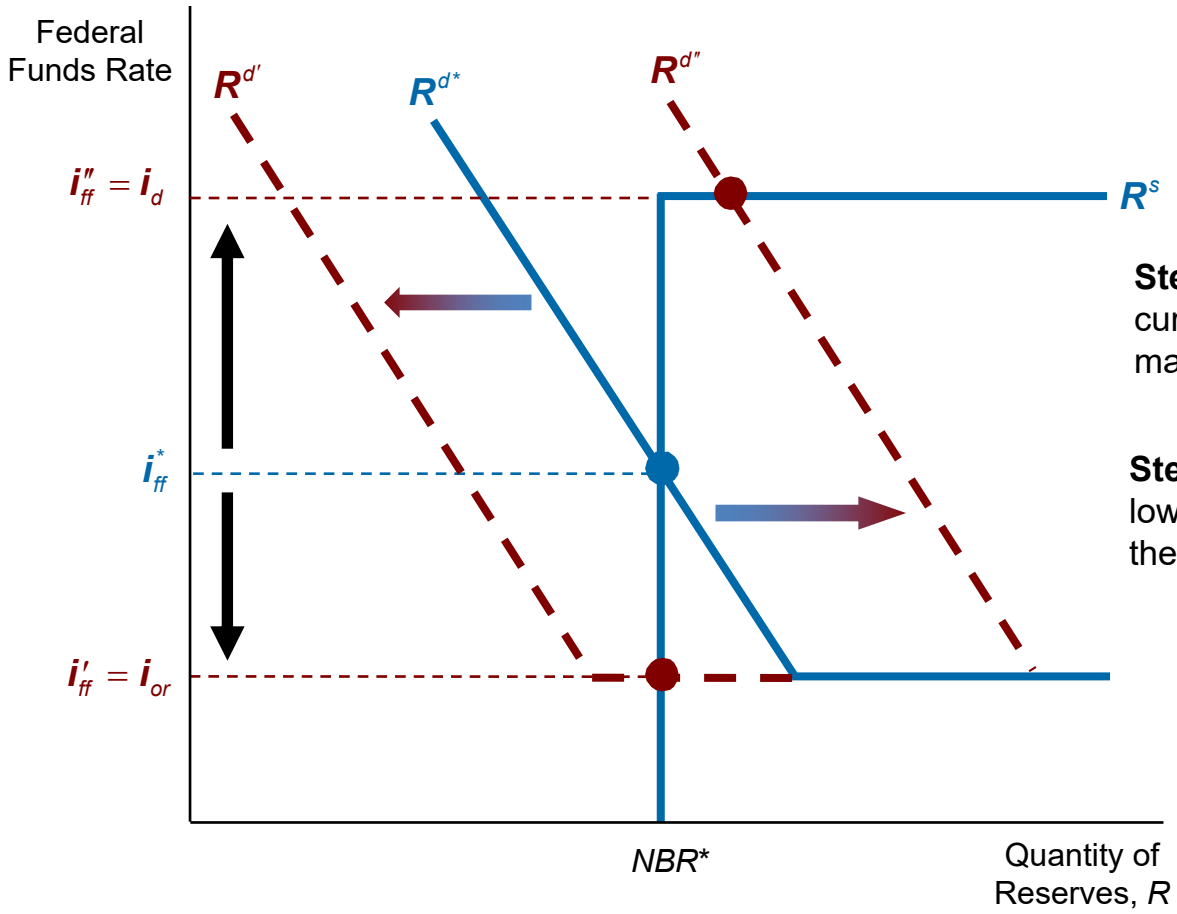
Repo Market Kerfuffle



The Economist

https://www.economist.com/finance-and-economics/2019/11/02/why-the-repo-market-went-awry

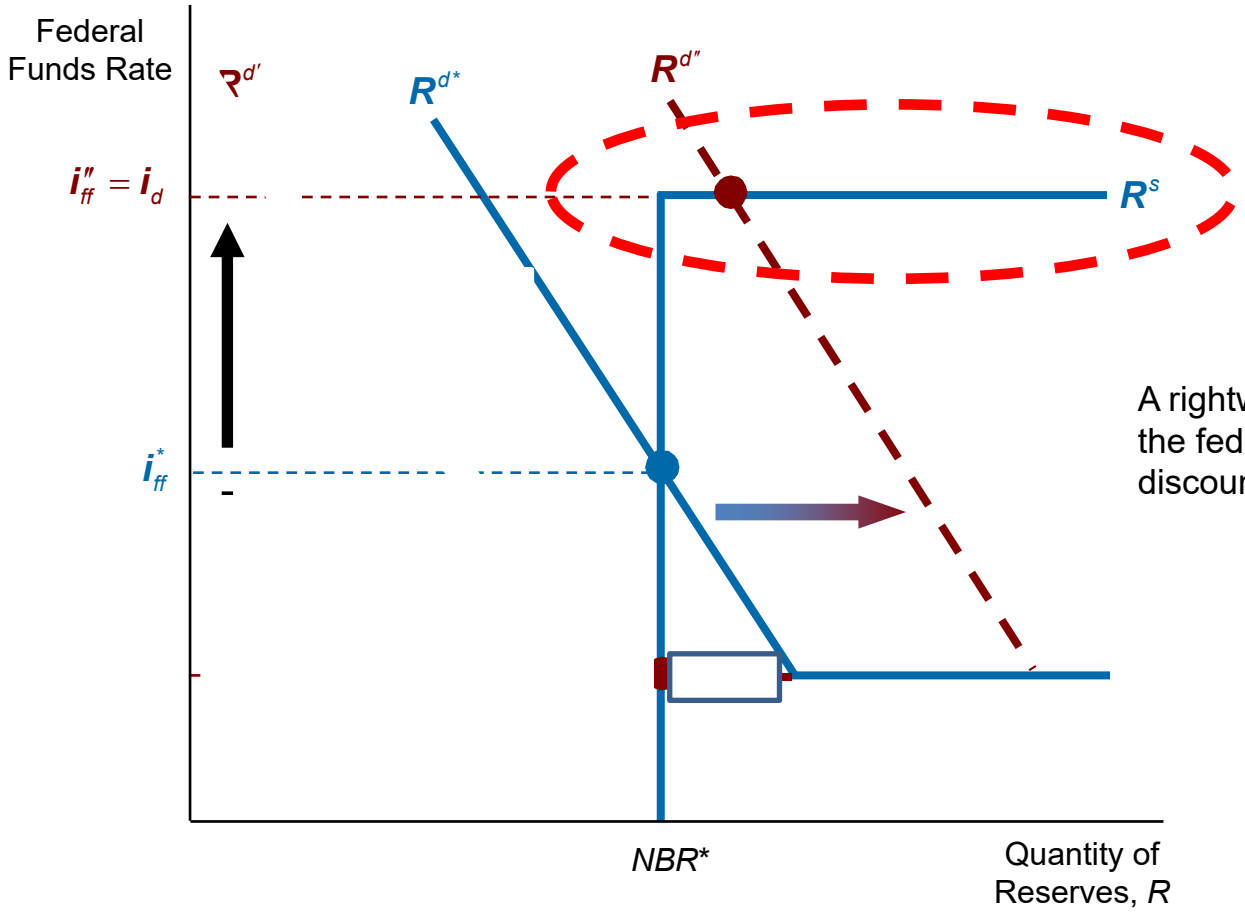
How the Federal Reserve's Operating Procedures Should Limit Fluctuations in the Federal Funds Rate



Step 1. A rightward shift of the demand curve raises the federal funds rate to a maximum of the discount rate.

Step 2. A leftward shift of the demand curve lowers the Ederal funds rate to a minimum of the interest rate on reserves.

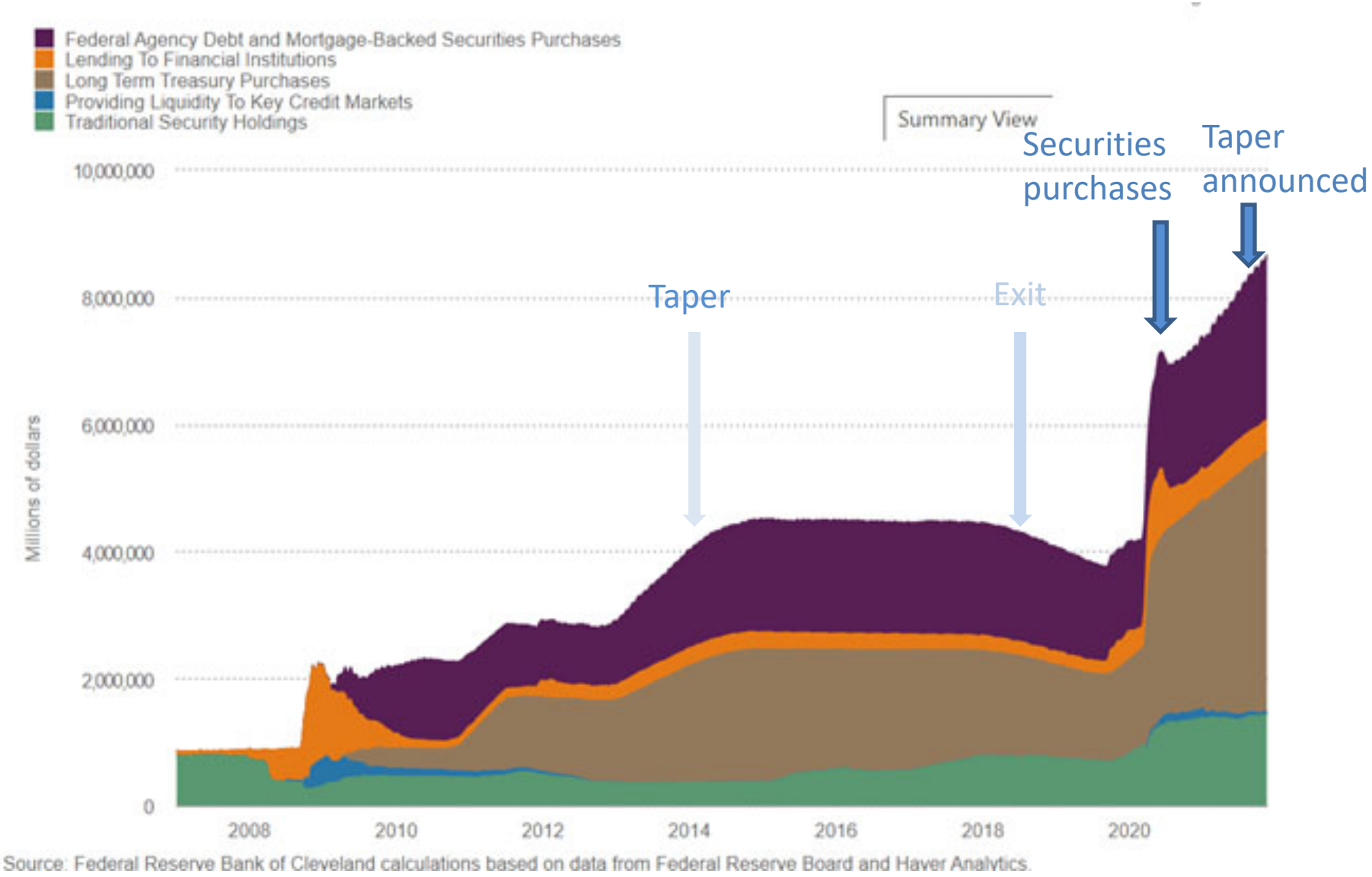
How the Federal Reserve's Operating Procedures Should Limit Fluctuations in the Federal Funds Rate



But Fed has to ensure sufficient reserves in the system, by way of Repo's

A rightward shift of the demand curve raises the federal funds rate to a maximum of the discount rate.

Return to Unconventional Monetary Policies



Source: Cleveland Fed https://www.clevelandfed.org/our-research/indicators-and-data/credit-easing.aspx

New/Renewed Fed Facilities

Federal Reserve 13(3) Facilities Announced during COVID-19 Pandemic			
Facility	Date Announced	Purpose	New for COVID-19 Pandemic?
Commercial Paper Funding Facility (CPFF)	March 17, 2020	Enhance the liquidity of the commercial paper market by providing a liquidity backstop to U.S. issuers of commercial paper	No, similar to CPFF announced on October 7, 2008
Primary Dealer Credit Facility (PDCF)	March 17, 2020	Provide funding to primary dealers to support market liquidity and functioning and facilitate credit availability to businesses and households	No, similar to PDCF announced on March 16, 2008
Money Market Mutual Fund Liquidity Facility (MMLF)	March 18, 2020	Assist money market funds in meeting demands for redemptions by households and other investors, enhancing credit provision to the broader economy	No, similar to Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility announced on September 19, 2008
Primary Market Corporate Credit Facility (PMCCF)	March 23, 2020	Support credit to large employers so that they are better able to maintain business operations and capacity	Yes
Secondary Market Corporate Credit Facility (SMCCF)	March 23, 2020	Support credit to large employers by providing liquidity for outstanding corporate bonds	Yes

New/Renewed Fed Facilities

Federal Reserve 13(3) Facilities Announced during COVID-19 Pandemic

Facility	Date Announced	Purpose	New for COVID-19 Pandemic?
Term Asset-Backed Securities Loan Facility (TALF)	March 23, 2020	Enable issuance of asset-backed securities backed by student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration, and certain other assets to support the flow of credit to consumers and businesses	No, similar to TALF announced on November 25, 2008
Main Street New Loan Facility (MSNLF) and Main Street Expanded Loan Facility (MSELF)	April 9, 2020	Enhance support for small and mid-sized business through loans to companies employing up to 10,000 workers or with less than $2.5 billion in revenues	Yes
Municipal Liquidity Facility	April 9, 2020	Purchase short term notes from state and local governments to help them better manage cash flow pressures	Yes
Paycheck Protection Program Lending Facility (PPPLF)	April 9, 2020	Supply liquidity to participating financial institutions to bolster the effectiveness of the Small Business Administration's Paycheck Protection Program	Yes

Notes: The table summarizes information about Federal Reserve liquidity and credit facilities authorized under section 13(3) of the Federal Reserve Act that were introduced during the COVID-19 pandemic. The FIMA Repo Facility does not require 13(3) authority and is not listed. *New for COVID-19* pandemic means that a facility with the same name did not operate during the 2007-09 financial crisis. Information is as of April 9, 2020.

Liberty Street Economics