

How the Federal Reserve implements monetary policy?

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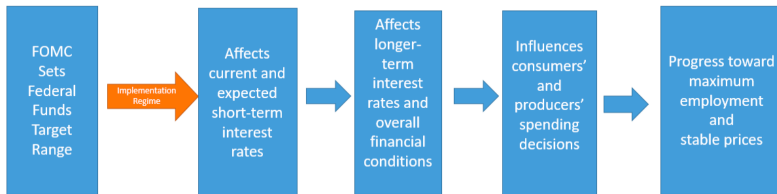
August 29, 2023

Outline

- 1 Standard Tools
- 2 Unconventional Tools: QE/QT
- 3 Appendix
- 4 References

How the policy rates affect economy?

Figure 1: Transmission of Monetary Policy



Source: Ihrig and Wolla (2020)

Federal Reserve Main policy tools

Table 1: Key concepts of an ample-reserves regime

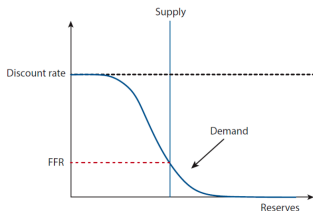
Concept	Fed's Choice	Role and Description
Policy Rate	Federal Funds Rate (FFR)	The way the Fed conducts monetary policy. The FOMC sets the target range (or the stance of policy) with the goal of moving the economy toward its dual mandate, as depicted in figure 1.
Reserve Level	Ample	Level of reserves in the banking system. The Fed supplies a level of reserves large enough so that small movements in this level do not influence the FFR. This level of reserves intersects the horizontal region of the demand curve in the money market diagram. This relatively high level implies the tools the Fed relies on for control of interest rates are its administered rates.
Policy Tools	Interest on Reserves (IOR)	Primary tool of monetary policy implementation. IOR is an administered rate that acts like a reservation rate for banks and, through arbitrage, helps steer the FFR into the FOMC's target range.
	Overnight Reverse Repurchase Agreement (ON RRP) rate	Supplemental tool of monetary policy implementation. The ON RRP rate is an administered rate that acts like a reservation rate for a large number of financial institutions and helps set a floor for the FFR.
	Discount rate	Tool of monetary policy implementation. The discount rate is an administered rate that is set above the target range, with the intention to serve as a ceiling for the FFR. "Stigma" of borrowing from the Fed may dampen the effect of being a firm ceiling.
	Open Market Operations (OMO)	Tool of monetary policy implementation. OMO are conducted periodically to maintain ample reserves. ⁹

Source: Ihrig and Wolla (2020)

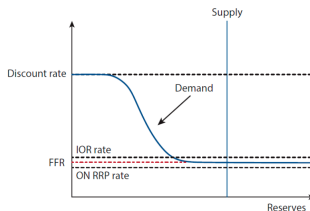
Comparison of two monetary policy frameworks

Figure 2: The Fed sets reserves supply at steep-end of the reserve demand curve in limited-reserves framework whereas it "sets" reserves supply at the flat-end of the curve in ample-reserves framework

A. Limited-reserves framework



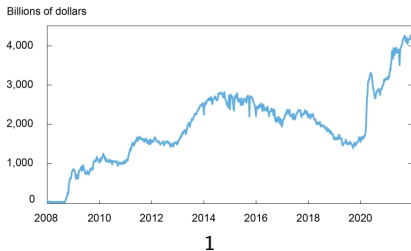
B. Ample-reserves framework



Source: [Ihrig and Wolla \(2020\)](#)

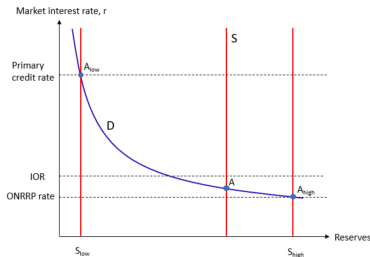
How the Fed sets policy in ample-reserves framework

Figure 3: The bank reserves have exponentially increased since the Global Financial Crisis ...



Source: [Federal Reserve](#)

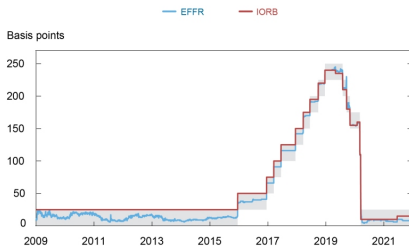
Figure 4: ... leading to the Fed introducing IORB and ON RRP to target the fed funds rate



Source: [Salido and Jorgensen \(2023\)](#)

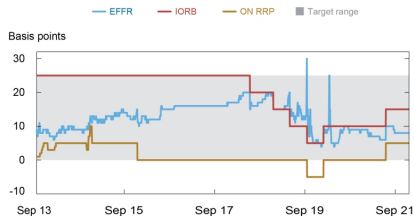
Role of IOR and ON RRP rate in keeping the Fed policy rate within the target

Figure 5: IORB acts as effective upper bound on the Fed funds rate ...



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Figure 6: ... while ON RRP acts as the lower bound on the fed funds rate



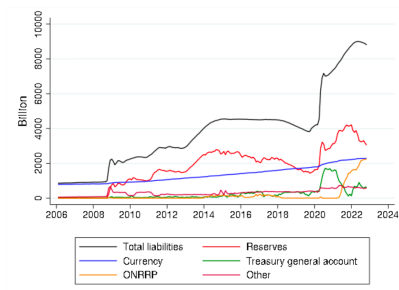
Source: [Federal Reserve](#)

Source: [Federal Reserve](#)

The Fed Balance sheet

Figure 7: The Federal Reserve's balance sheet, 2006M1-2022M10

The figure is based on data from the Federal Reserve's H.4 release. Data are monthly averages.



Source: [Salido and Jorgensen \(2023\)](#)

Table 2: Federal Reserve balance sheet, October 26, 2022

The table is based on data from the Federal Reserve's H.4 release.

Assets (\$B)		Liabilities (\$B)	
Treasuries	5,609	Reserves	3,108
MBS	2,679	Overnight reverse repurchase agreements	2,187
Other	485	Currency	2,285
		Treasury general account	557
		Other	636
	8,773		8,773

Source: [Salido and Jorgensen \(2023\)](#)

Typical Actors in the Fed OMO operation

Figure 8: Initial balance sheet conditions

Initial Balance Sheet Conditions

FEDERAL RESERVE		TREASURY	
Assets	Liabilities	Assets	Liabilities
Treasury securities	Reserves held by banks	Cash held at the Fed	Treasury securities
	Cash held by the Treasury		

BANKING SECTOR		PUBLIC	
Assets	Liabilities	Assets	Liabilities
Treasury securities	Deposits	Deposits	Wealth
Reserves at the Fed		Treasury securities	

Notes: The "wealth" term equals assets less liabilities—akin to "equity" in the case of a corporation. Since this value is ultimately owed to a specific party—be it the members of a household or, in the case of equity, the owners of a corporation—it is listed as a liability on the public's balance sheet, as is standard practice in accounting.

Source: [Federal Reserve](#)

Quantitative Easing: When the Fed buys

Figure 9: When the Fed purchases assets from banks, the banks balance sheet do not expand ...

The Fed Purchases Assets from Banks
Balance Sheet Effects

FEDERAL RESERVE		TREASURY	
Assets	Liabilities	Assets	Liabilities
Treasury securities +\$1	Reserves held by banks +\$1	Cash held at the Fed	Treasury securities
	Cash held by the Treasury		

BANKING SECTOR		PUBLIC	
Assets	Liabilities	Assets	Liabilities
Treasury securities -\$1	Deposits	Deposits	Wealth
Reserves at the Fed +\$1		Treasury securities	

Note: Linked effects are assigned the same color.

Figure 10: ... where as it does expand when the Fed purchases from the public

The Fed Purchases Assets from the Public
Balance Sheet Effects

FEDERAL RESERVE		TREASURY	
Assets	Liabilities	Assets	Liabilities
Treasury securities +\$1	Reserves held by banks +\$1	Cash held at the Fed	Treasury securities
	Cash held by the Treasury		

BANKING SECTOR		PUBLIC	
Assets	Liabilities	Assets	Liabilities
Treasury securities	Deposits +\$1	Deposits +\$1	Wealth
Reserves at the Fed +\$1		Treasury securities -\$1	

Note: Linked effects are assigned the same color.

Source: [Federal Reserve](#)

Source: [Federal Reserve](#)

Quantitative Tightening: When the Fed held security matures

Figure 11: When the Fed held security matures, the Fed balance sheet contracts

Fed-Held Treasury Security Matures, No Treasury Issuance
Balance Sheet Effects

FEDERAL RESERVE		TREASURY	
Assets	Liabilities	Assets	Liabilities
Treasury securities -\$1	Reserves held by banks Cash held by the Treasury -\$1	Cash held at the Fed -\$1	Treasury securities -\$1

BANKING SECTOR		PUBLIC	
Assets	Liabilities	Assets	Liabilities
Treasury securities Reserves at the Fed	Deposits	Deposits Treasury securities	Wealth

Note: Linked effects are assigned the same color.

Source: [Federal Reserve](#)

More on Limited vs Ample-Reserves Framework

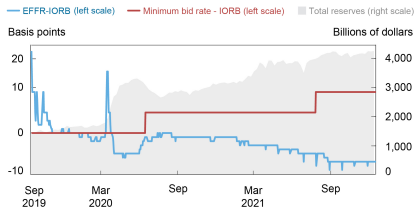
Table 3: A comparison of the limited and Ample-Reserves Regimes

	Limited-Reserves Regime	Ample-Reserves Regime
Level of Reserves	Limited; banks manage levels, in part, to meet reserve requirements	Ample; banks tend to have plenty of reserves for all operational needs
Key policy tools	Open Market Operations (OMO) Reserve Requirements	Interest on Reserves (IOR) is primary tool Overnight Reverse Repo Facility (ON RRP rate) is supplemental tool.
Reserve requirements	Reserve requirements are one factor that cause banks to demand reserves. Banks pay attention to their level of reserves relative to their reserve requirement. Banks that are short (long) of their requirement can turn to the federal funds market to borrow (lend) funds.	Because of a high level of reserves in the banking system, most banks hold excess reserves and so reserve requirements are not a significant factor in their decision-making. As of March 2020, reserve requirement ratios were set to zero.
Supporting policy tools	Discount window ¹⁰	Open market operations Discount window
Graphing: Where Supply intersects Demand	Supply intersects demand on the steep, downward sloping, part of the demand curve.	Supply intersects demand on the flat part of the demand curve.
Graphing: Change in Policy Rate	The Fed affects the FFR by using OMOs to shift the supply curve left or right.	The Fed affects the FFR by raising or lowering the IOR and ON RRP rates to shift the flat portion of the demand curve up or down.
Example: Key tools' action to implement expansionary monetary policy	FOMC lowers the FFR target. Fed purchases U.S. Treasury Securities using open market operations to increase the supply of reserves.	FOMC lowers the FFR target range. The Fed lowers its administered rates.

Source: [Ihrig and Wolla \(2020\)](#)

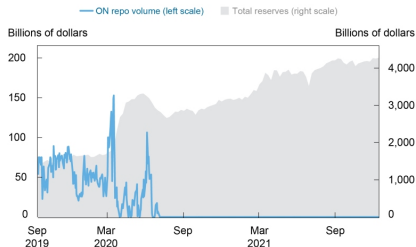
Fed's Latest Tool: Standing Repo Facility

Figure 14: Minimum bid rate was increased above IORB as market conditions improved ...



Source: [Federal Reserve](#)

Figure 15: ... leading to a decline in ON Repo take up

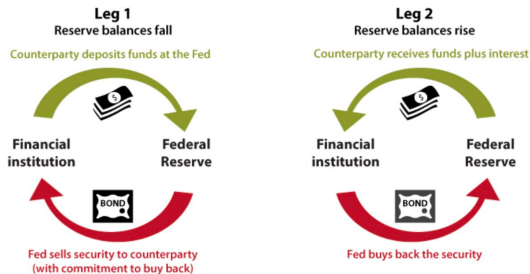


Source: [Federal Reserve](#)

Overnight Reverse Repo Operation

Figure 16: A typical ON RRP transaction

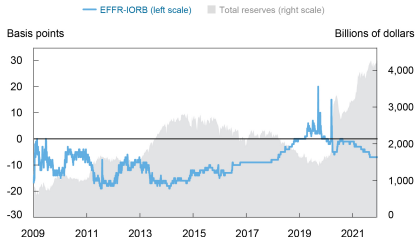
Illustration of an ON RRP Transaction



Source: [Ihrig and Wolla \(2020\)](#)

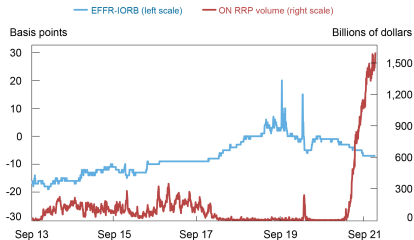
Relationship between reserve, EFFR rate and ON RRP take up

Figure 17: The Spread between the EFFR and the IORB Rate Tends to Decrease when Reserves Increase ...



Source: [Federal Reserve](#)

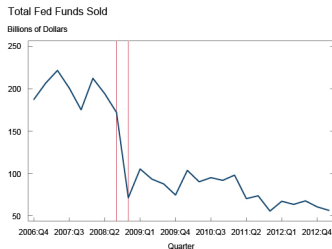
Figure 18: ... leading to higher ON RRP take up



Source: [Federal Reserve](#)

The size of the Fed funds market size

Figure 19: The fed funds market size has declined since the GFC as the banks pulled out, and started investing in IORB facility



Source: FFIEC 002, 031, 041, 10-Q, 10-K, and Y-9C filings.

Notes: The red lines denote filings for the third and fourth quarters of 2008. The chart reflects fed funds sold by bank holding companies, stand-alone commercial banks, foreign banking organizations, and Federal Home Loan Banks. Fed funds sold by thrifts are included only after the first quarter of 2012, when they become publicly available. Data do not include lending by Fannie Mae or Freddie Mac, as historically those agencies report federal funds jointly with repo transactions in their regulatory filings, although additional information on their fed funds activity is often included on an ad hoc basis in the text and footnotes of their 10-Q and 10-K filings.

Source: [Federal Reserve](#)

References

■ Liberty Street Posts

- How the Federal Reserve's Monetary Policy Implementation Framework Has Evolved
- How the Fed's Overnight Reverse Repo Facility Works
- How the Fed Adjusts the Fed Funds Rate within Its Target Range
- The Fed's Latest Tool: A Standing Repo Facility
- Whos lending in the fed funds market
- How the Fed Changes the Size of Its Balance Sheet
- How the Fed Changes the Size of Its Balance Sheet: The Case of Mortgage-Backed Securities
- Let's close the gap: Revising teaching materials to reflect how the Federal Reserve implements monetary policy: Jane Ihrig and Scott Wolla (2020)
- St. Louis's Fed: Teaching the New Tools of Monetary Policy