

### The Money Supply Process

**Figure 17.1** The Central Bank's Balance Sheet

	Assets	Liabilities
Government's Bank	Securities Foreign exchange reserves	Currency Government's account
Bankers' Bank	Loans	Accounts of the commercial banks (reserves)

**Figure 17.2** Balance Sheet Changes after the Federal Reserve Purchases a U.S. Treasury Bond

A. Federal Reserve's Balance Sheet		B. Banking System's Balance Sheet	
Assets	Liabilities	Assets	Liabilities
Securities +\$1 billion (U.S. Treasury bond)	Reserves +\$1 billion	Reserves +\$1 billion Securities -\$1 billion (U.S. Treasury bond)	

**Figure 17.3** Balance Sheet Changes after the Federal Reserve Purchases a German Government Bond

A. Federal Reserve's Balance Sheet		B. Banking System's Balance Sheet	
Assets	Liabilities	Assets	Liabilities
Foreign exchange reserves +\$1 billion (German government bonds in euros)	Reserves +\$1 billion	Reserves +\$1 billion Securities -\$1 billion (German government bonds)	

**Figure 17.5** Balance Sheet Changes after a Private Person Withdraws Cash from His or Her Bank Account

A. Nonbank Public's Balance Sheet		B. Federal Reserve's Balance Sheet		C. Banking System's Balance Sheet	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Currency +\$100 Checkable deposits -\$100			Currency +\$100 Reserves -\$100	Reserves -\$100	Checkable deposits -\$100

**Figure 17.6** Changes in *First Bank's* Balance Sheet after the Fed's Purchase of a U.S. Treasury Bond

A. Immediate Impact			
Assets		Liabilities	
Reserves	+\$100,000		
Securities	-\$100,000		

B. After the Extension of a Loan		C. After Withdrawal by the Borrower	
Assets		Liabilities	
Reserves	+\$100,000	Reserves	\$0
Securities	-\$100,000	Securities	-\$100,000
Loans	+\$100,000	Loans	+\$100,000
		Checkable deposits	+\$100,000
		Checkable deposits	\$0

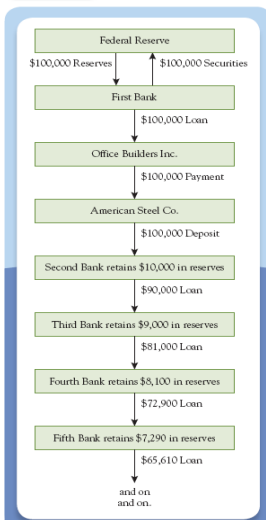
**Figure 17.7** Changes in Balance Sheets

A. <i>Second Bank</i> after American Steel's Deposit		B. <i>Second Bank</i> after Extension of a Loan	
Assets		Liabilities	
Reserves	+\$100,000	Reserves	+\$10,000
		Loan	+\$90,000
		American Steel's checking account	+\$100,000

C. <i>Third Bank</i> after Deposit and Extension of a Loan			
Assets		Liabilities	
Reserves	+\$9,000	Checking account	+\$90,000
Loan	+\$81,000		

**Figure 17.8** Multiple Deposit Creation



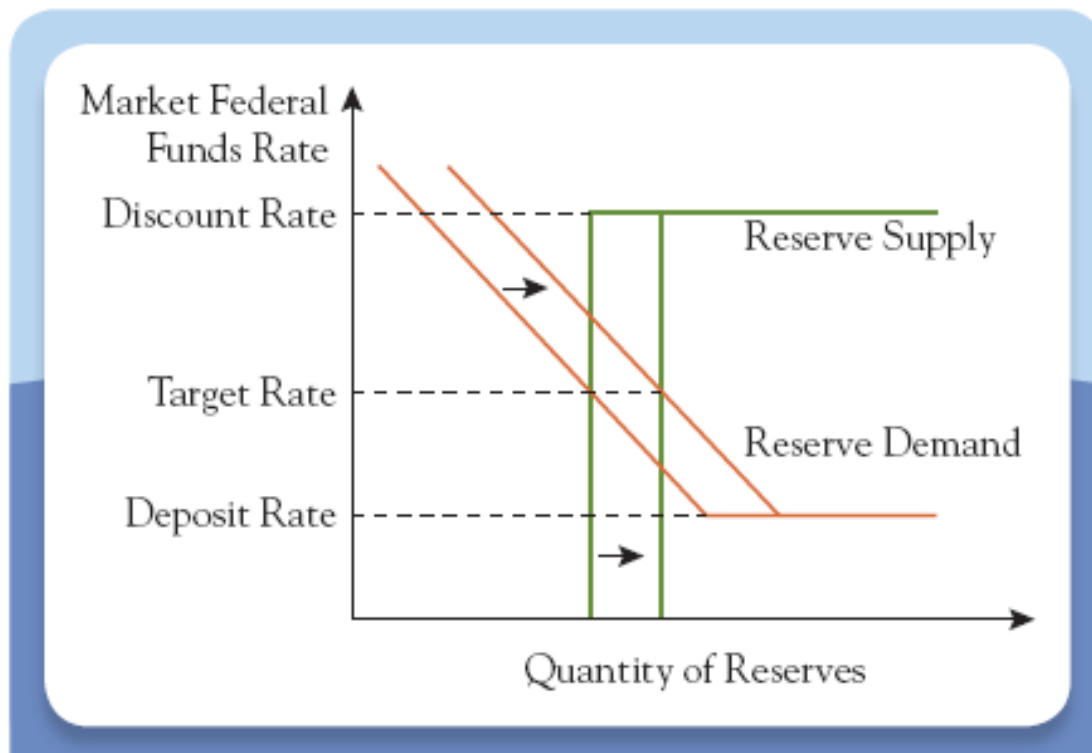
**Table 17.3** Multiple Deposit Expansion following a \$100,000 Open Market Purchase Assuming a 10% Reserve Requirement

Bank	Increase in Deposits	Increase in Loans	Increase in Reserves
First Bank	\$0	\$100,000	\$0
Second Bank	\$100,000	\$90,000	\$10,000
Third Bank	\$90,000	\$81,000	\$9,000
Fourth Bank	\$81,000	\$72,900	\$8,100
Fifth Bank	\$72,900	\$65,610	\$7,290
Sixth Bank	\$65,610	\$59,049	\$6,561
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The Banking System	\$1,000,000	\$1,000,000	\$100,000

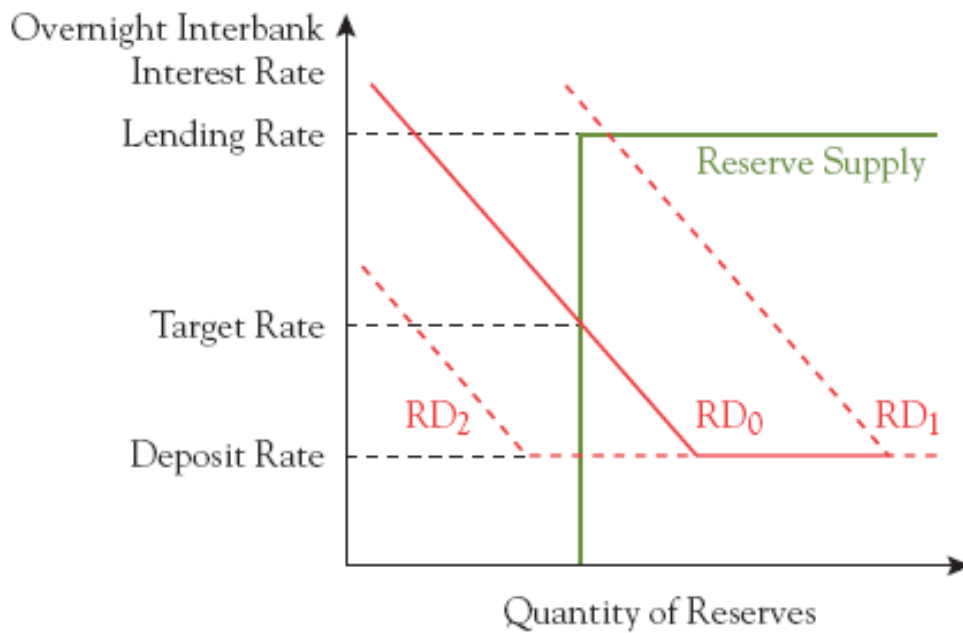
**Table 18.1** The Tools of U.S. Monetary Policy

	What Is It?	How Is It Controlled?	What Is Its Impact?
<b>Target Federal Funds Rate</b>	Interest rate charged on overnight loans between banks.	Supply of reserves adjusted through open market operations to meet expected demand at the target rate.	Changes interest rates throughout the economy.
<b>Discount Rate</b>	Interest rate charged by the Federal Reserve on loans to commercial banks.	Set at a premium over the target federal funds rate.	Ceiling on market federal funds rate. Means to provide liquidity to banks in times of crisis.
<b>Deposit Rate</b>	Interest rate paid by the Federal Reserve on excess reserves held by banks.	Set at a spread below the target funds rate.	Sets a floor under the market federal funds rate.
<b>Reserve Requirement</b>	Fraction of deposits that banks must keep either on deposit at the Federal Reserve or as cash in their vaults.	Set by the Federal Reserve Board within a legally imposed range.	Stabilizes the demand for reserves.

**Figure 18.3** The Market for Bank Reserves



**Figure 18.5** The Channel System



**Table 18.2** Some Unconventional Policy Tools

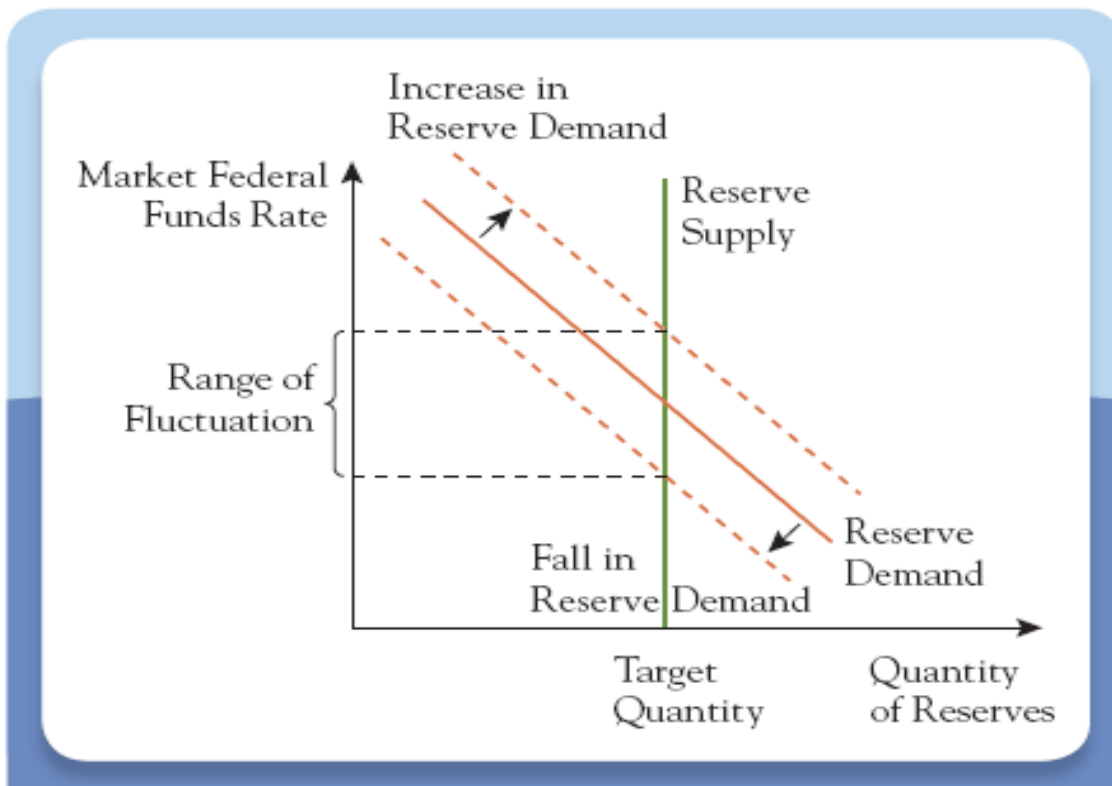
Policy Tool	Description
Term Auction Facility (TAF)	The Fed auctions a fixed volume of funds at maturities less than three months against collateral to depository institutions.
Primary Dealer Credit Facility (PDCF)	The Fed lends overnight to primary dealers (including nonbanks) against a broad range of collateral.
Term Securities Lending Facility (TSLF)	The Fed provides Treasury securities in exchange for a broad range of collateral in order to promote market liquidity.
Asset-backed Commercial Paper (ABCP) Money-Market Mutual Fund (MMMF) Liquidity Facility	The Fed lends to depositories and bank holding companies to finance purchases of ABCP from MMMFs.
Commercial Paper Funding Facility (CPFF)	The Federal Reserve Bank (FRB) of New York finances the purchase of commercial paper from eligible issuers via primary dealers.
Money-Market Investor Funding Facility (MMIFF)	The FRB New York funds investment vehicles that purchase assets from MMMFs.
Term Asset-Backed Securities Loan Facility (TALF)	The FRB New York lends to holders of high-rated newly issued asset-backed securities (ABS), using the ABS as collateral.

LSAP (Large Scale Asset Purchases)  
 Operation Twist  
 Extended guidance

Purchases of MBS, LT Treasuries  
 Swapping LT Treasuries for ST Treasuries  
 Setting or conditioning Fed funds rates into the future

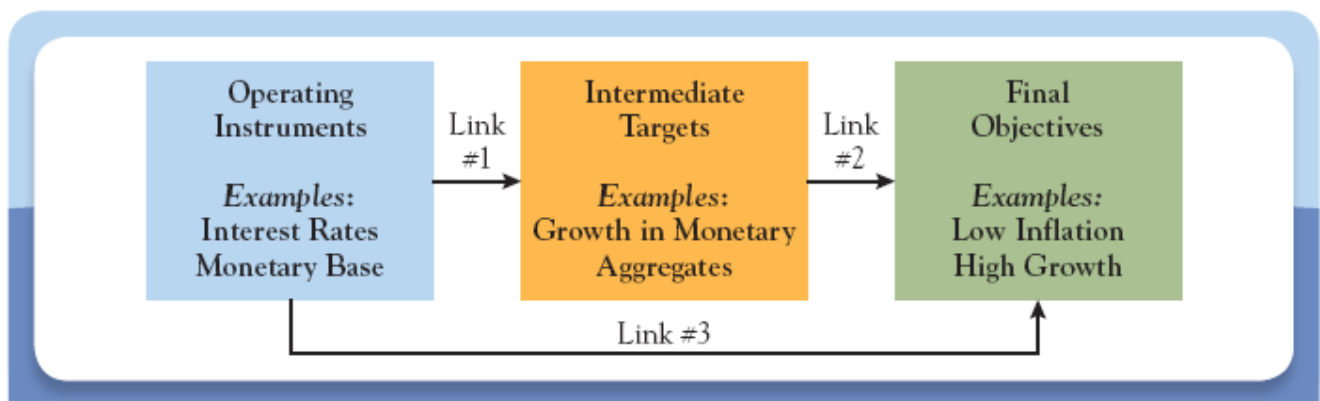
**Figure 18.7**

The Market for Bank Reserves when the Fed Targets the Quantity of Reserves



**Figure 18.8**

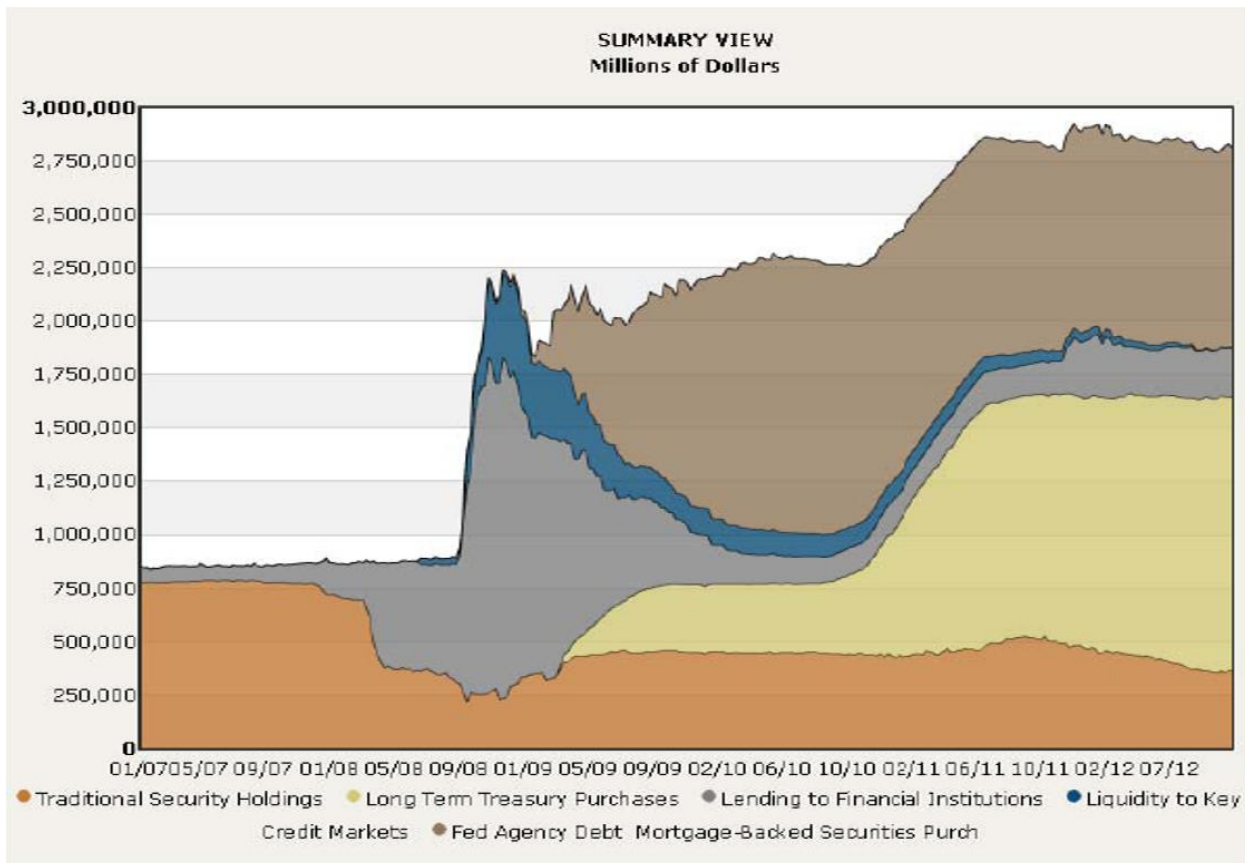
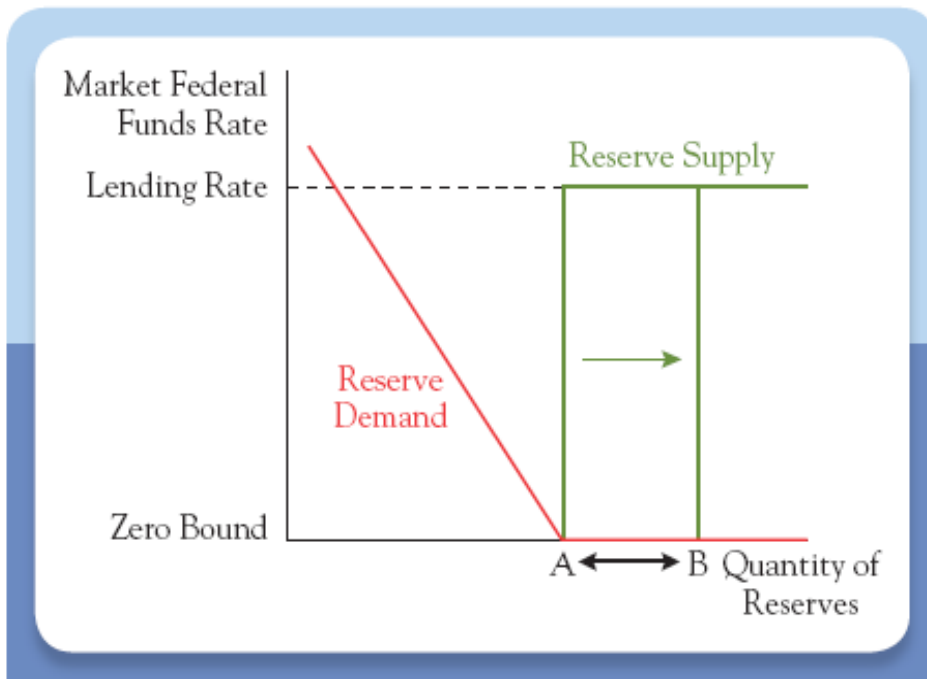
Instruments, Targets, and Objectives



### Unconventional Policy Measures

1. Policy duration commitment
2. Quantitative Easing (QE)
3. Credit Easing (CE)

**Figure 18.10** Quantitative Easing



Source: Federal Reserve Bank of Cleveland.

**Chart 9. Impact of QE1 and QE2 on economy**

	MA	Boston Fed		Chung et al. (2012) (FRB/US)	Chen et al. (2011)	DB
		VAR	BF Model			
10-Year Treasury (bps)	-78	-98	-98	-60	-39 to -78	-155
Real GDP (percent)	1.57	2.58	2.45	3.00	0.39 to 1.18	1.95
UE Rate (% points)	-0.78	-1.29	-1.22	-1.50	-0.20 to -0.59	-0.97
Employment (mm)	1.4	2.0	1.9	3.0	0.3 to 0.9	1.5
Residential Investment (percent)	N/A	N/A	14.07	N/A	N/A	N/A

Sources: MA (February 7, 2011), Fuhrer and Olivei (2011), Chung, Lafora, Reifschneider, and Williams (2012), Chen, Curdia, and Ferraro (2011), and DB Global Markets Research

**Chart 11. Estimated impact of QE3, cumulative over eight quarters**

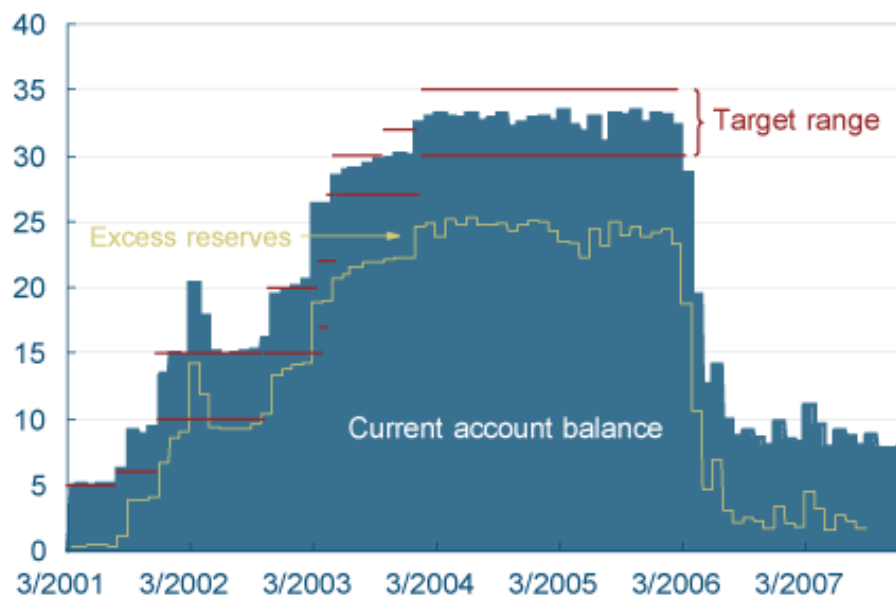
10-Year Treasury (bps)	-51
Real GDP (percent)	0.64
UE Rate (percentage points)	-0.32
House Prices (percent)	1.82
S&P 500 (percent)	3.06
Inflation Expectations (percent)	0.25

Sources: DB Global Markets Research

Source: Deutsche Bank, "QE3 to Boost Asset Values and Growth," *Global Economic Perspectives* (Sep. 27, 2012).

## Quantitative Easing

Trillions of yen



Source: Bank of Japan.

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>

**Figure 18.11**

**Exiting Quantitative Easing by Hiking the Deposit Rate**

