

Public Affairs 974-1  
Monetary and Financial Policy in the  
Wake of the Financial Crisis  
(11/15/12)

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# Central Banks in the Financial System

**TABLE 14.1 FINANCIAL RELATIONSHIPS (BALANCE SHEETS) BETWEEN THE BANKS, THE FED, THE GOVERNMENT, AND THE PRIVATE SECTOR**

PRIVATE NONFINANCIAL		BANKS		FED		GOVERNMENT	
ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES	ASSETS	LIABILITIES
					Currency (CU)		
			Deposits (D)				
		Bonds (B)		Bonds (B)			Bonds (B)
			Reserves (RE)		Reserves (RE)		
	Loans	Loans					

# The Central Bank's Balance Sheet

## Open Market Operations

**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 (U.S. Treasury bond)      +\$1 billion	Reserves      +\$1 billion	Reserves      +\$1 billion	
		Securities (U.S. Treasury bond)      -\$1 billion	

# Foreign Exchange Intervention, Cash Withdrawal

**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

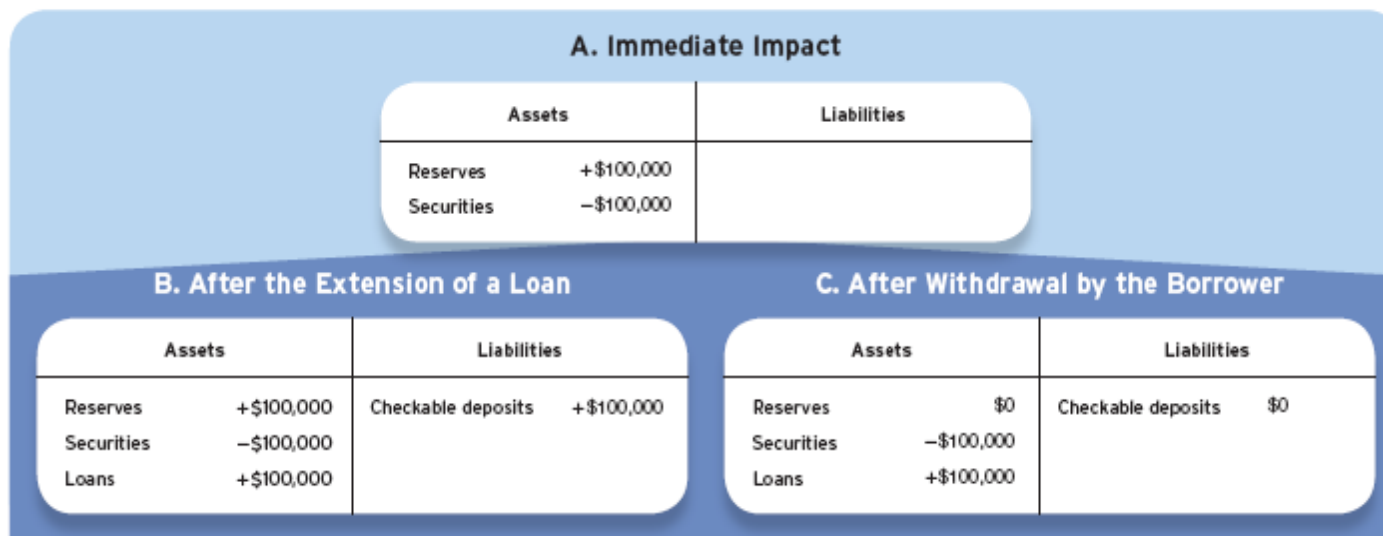
A. Nonbank Public's Balance Sheet			
Assets		Liabilities	
Currency	+\$100		
Checkable deposits	-\$100		

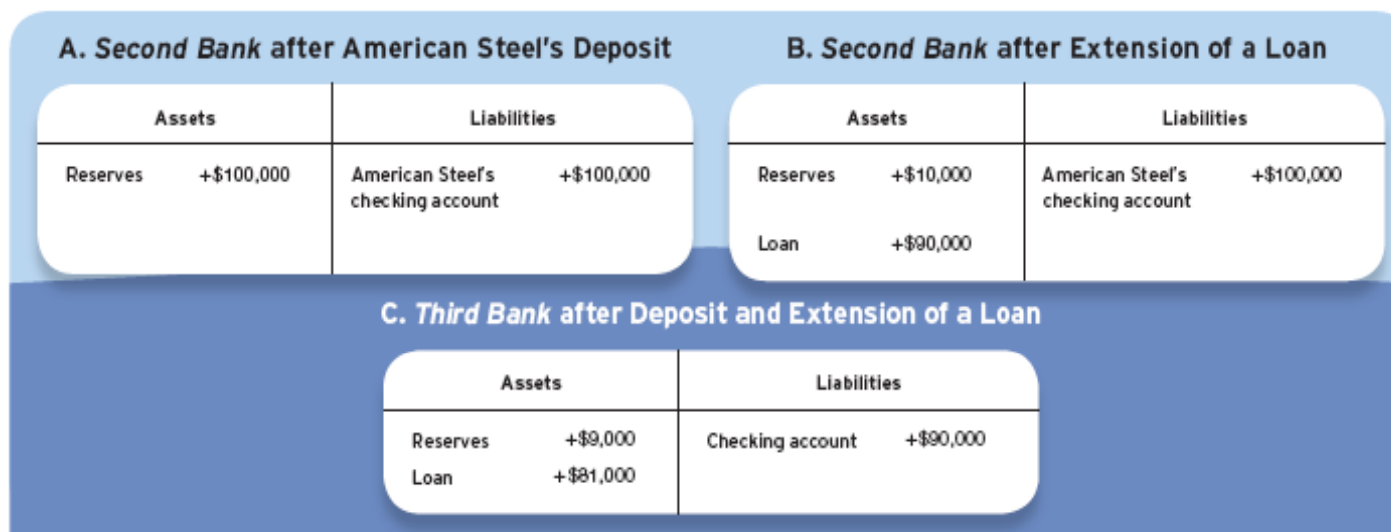
B. Federal Reserve's Balance Sheet		C. Banking System's Balance Sheet	
Assets	Liabilities	Assets	Liabilities
	Currency +\$100	Reserves -\$100	Checkable deposits -\$100
	Reserves -\$100		

# Deposit Creation

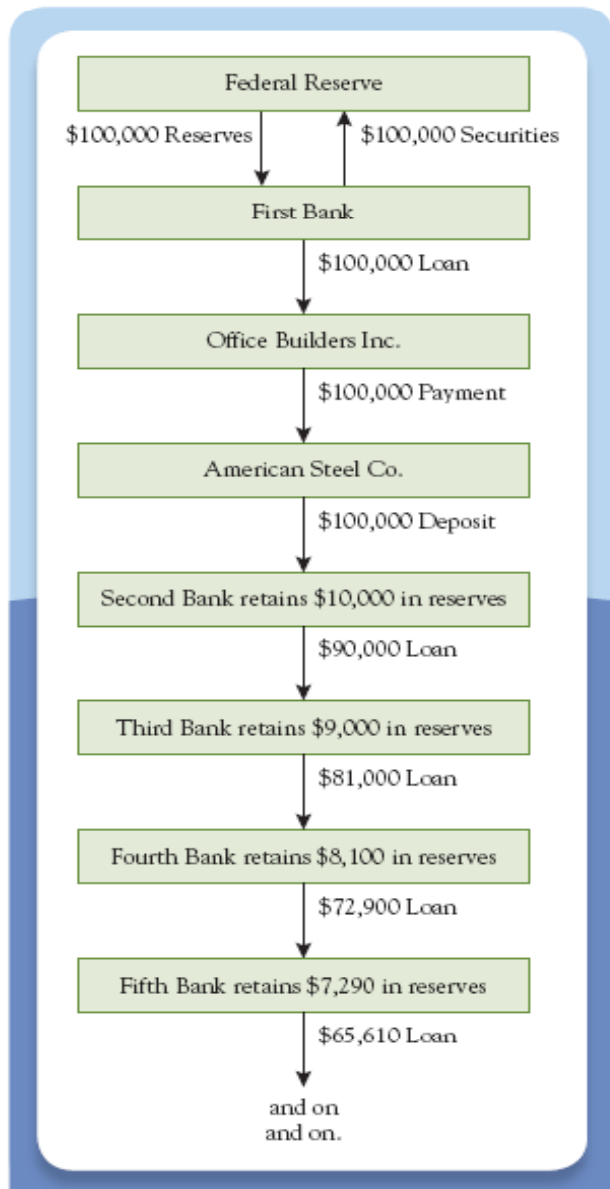
**Figure 17.6** Changes in *First Bank's* Balance Sheet after the Fed's Purchase of a U.S. Treasury Bond



**Figure 17.7** Changes in Balance Sheets



**Figure 17.8** Multiple Deposit Creation



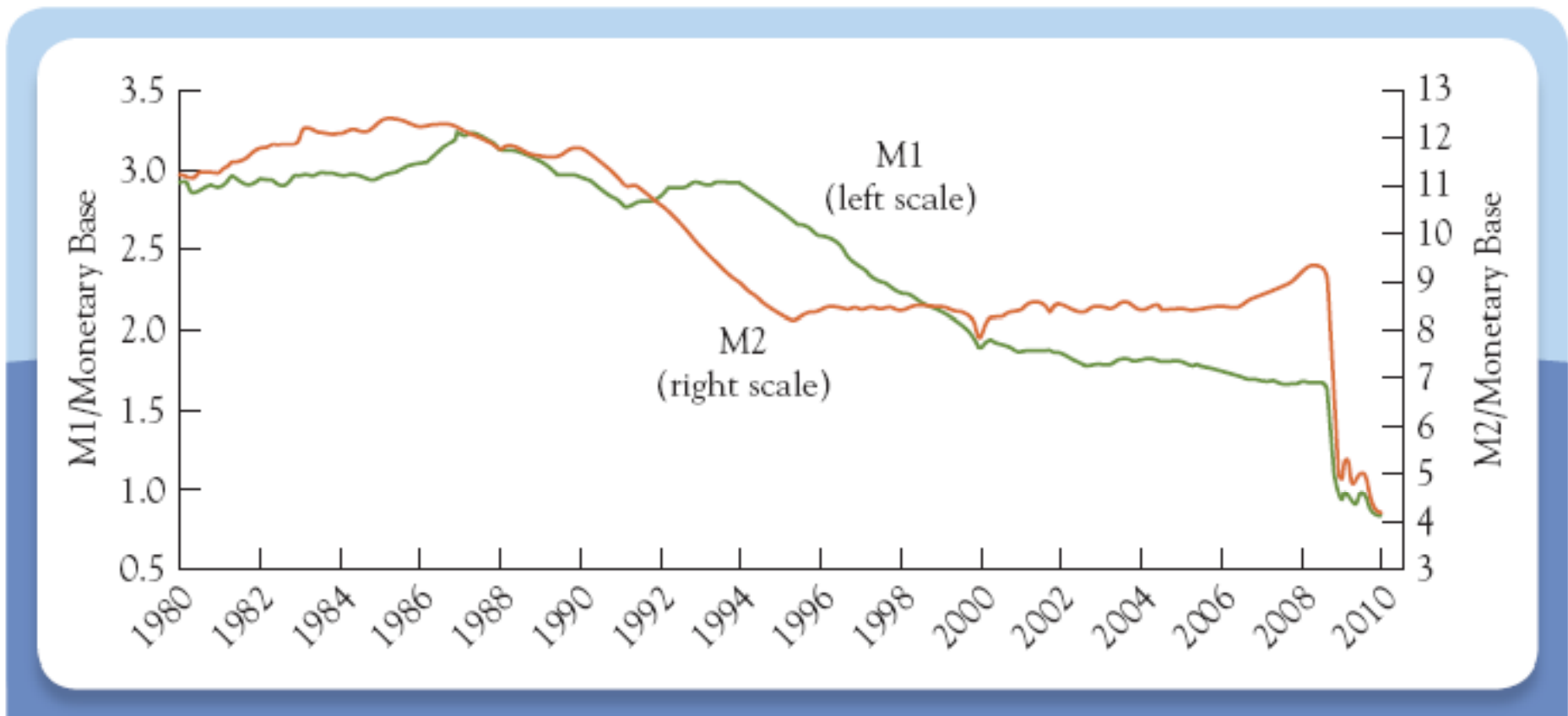
**Table 17.3**

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
.	.	.	.
.	.	.	.
.	.	.	.
<b>The Banking System</b>	<b>\$1,000,000</b>	<b>\$1,000,000</b>	<b>\$100,000</b>

# The Limits on the Central Bank's Ability to Control the Quantity of Money

Figure 17.11 The M1 and M2 Money Multipliers, 1980-2009



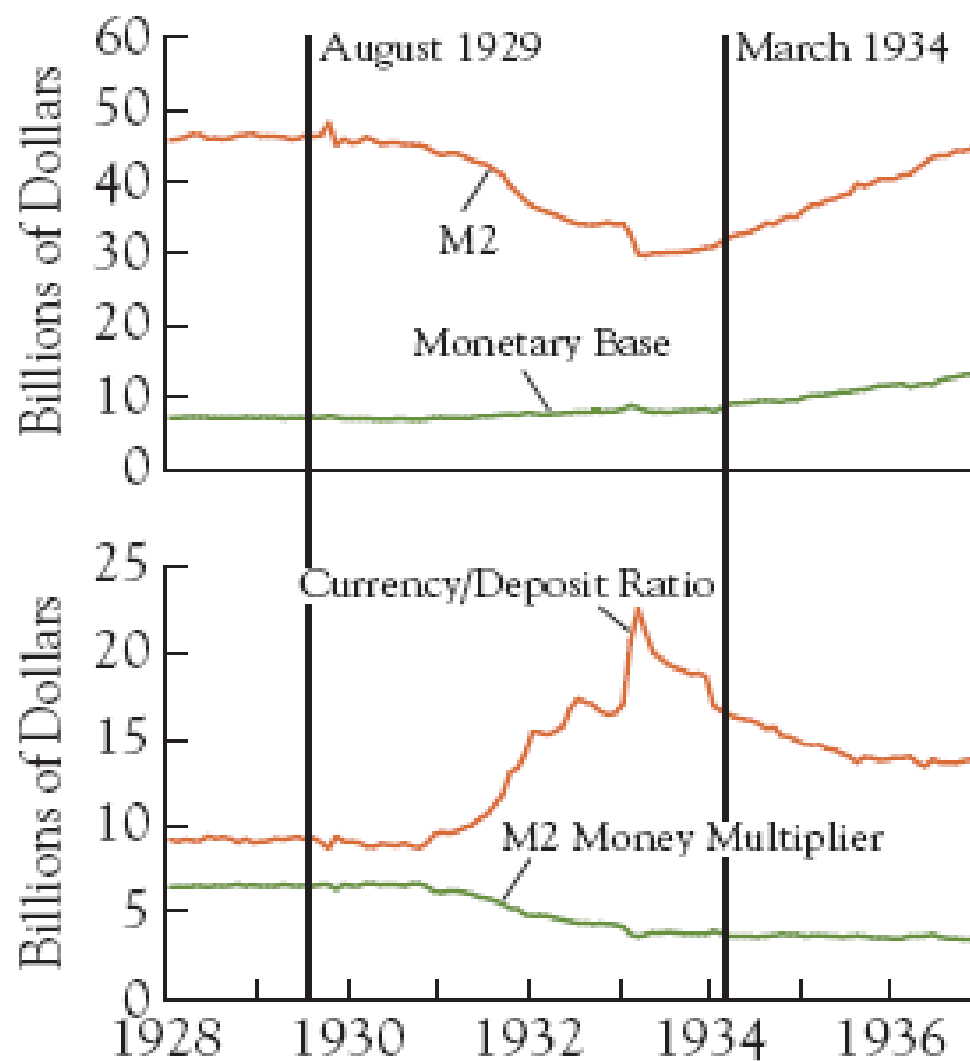


**APPLYING THE CONCEPT**  
MONETARY POLICY  
IN THE 1930S

- In the 1930s the Fed saw its balance sheet growing.
- Officials did not realize that the money multiplier was falling.
- Without knowing it, the Fed ran a contractionary policy during the Depression.

**Figure 17.10**

Components of Money,  
1928-1936





# The Fed's Conventional Policy Toolbox

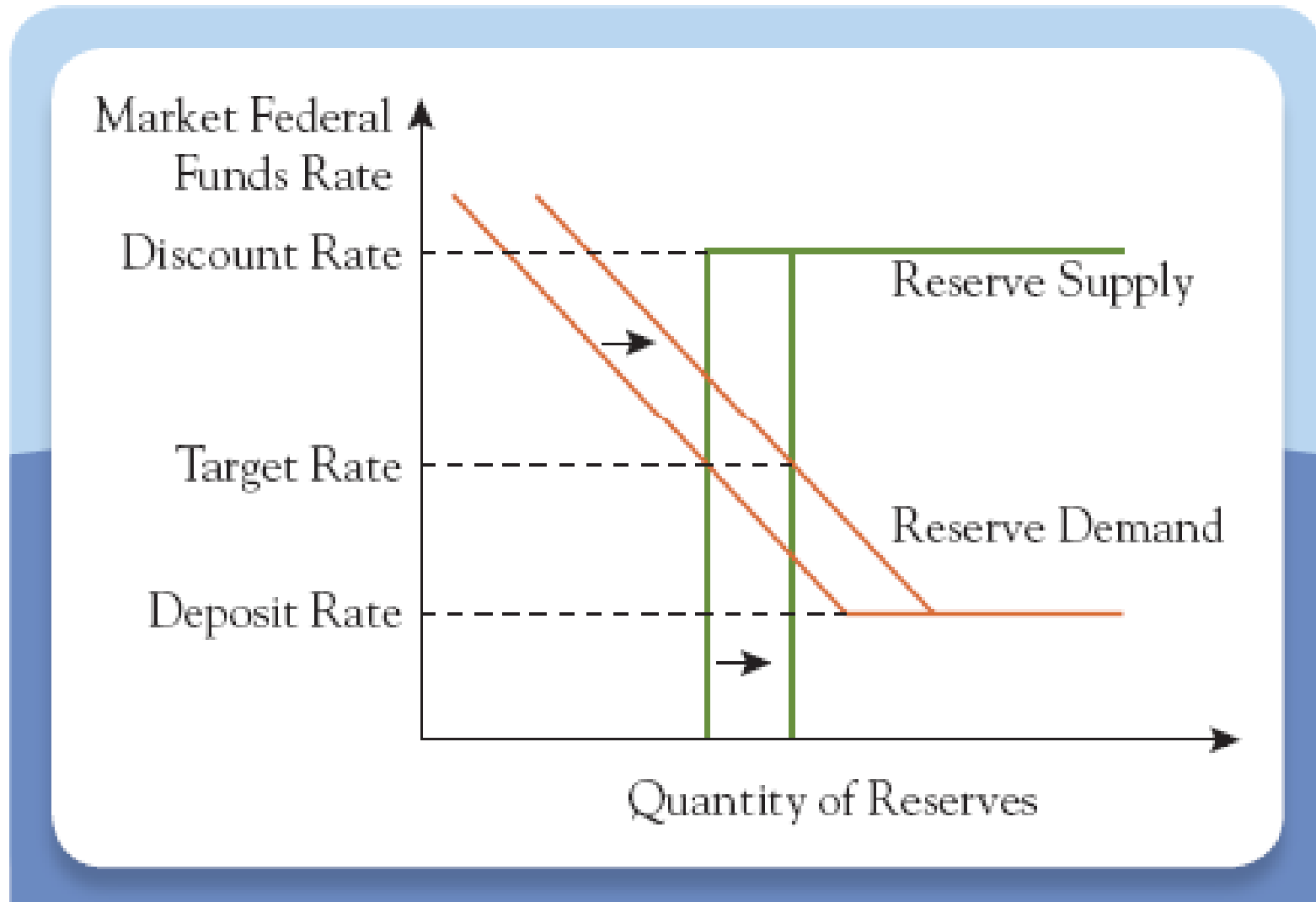
**Table 18.1** The Tools of U.S. Monetary Policy

	<b>What Is It?</b>	<b>How Is It Controlled?</b>	<b>What Is Its Impact?</b>
<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.

# The Target Fed Funds Rate & Open Mkt. Ops.

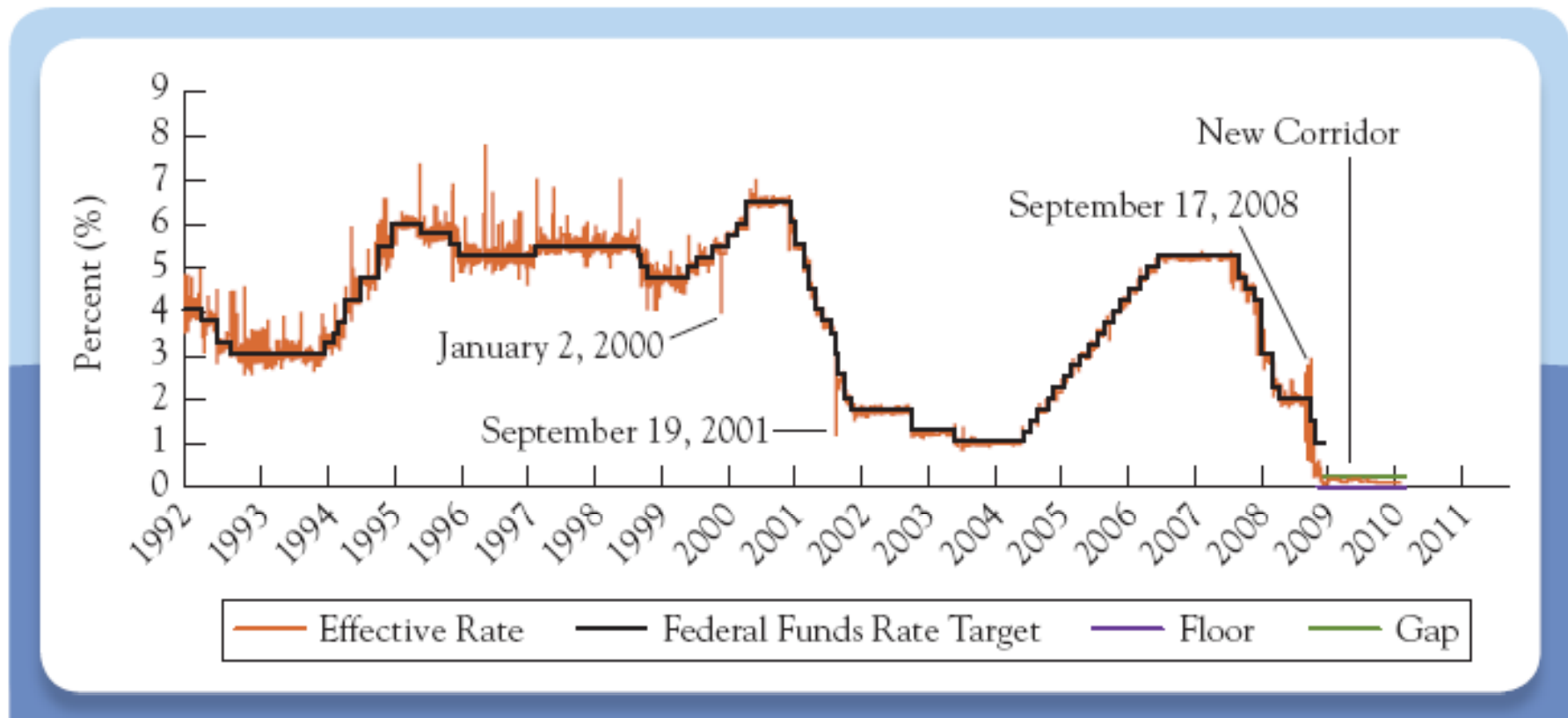
**Figure 18.3**

The Market for Bank Reserves



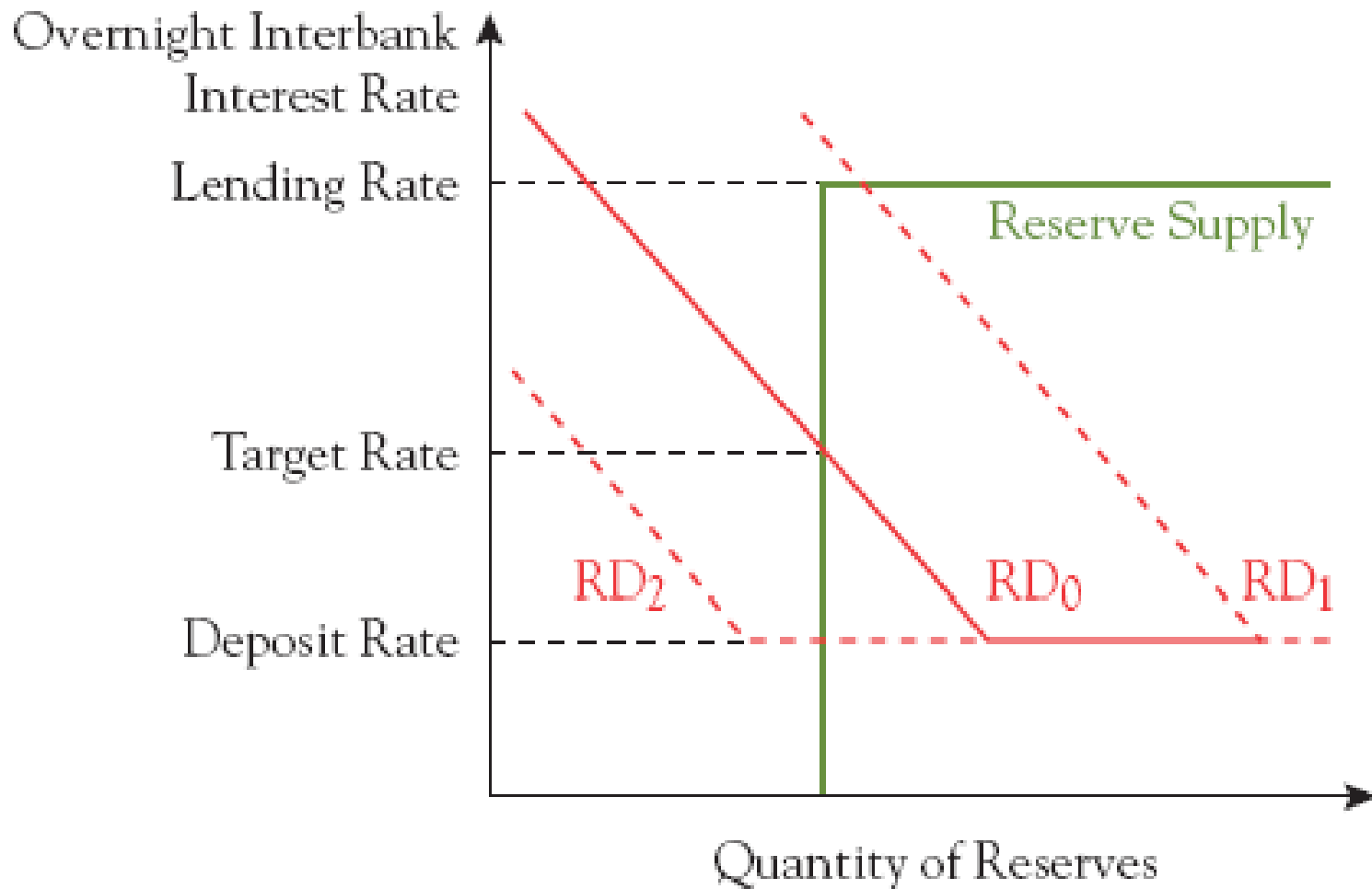
# The Target Fed Funds Rate

**Figure 18.4** Target Federal Funds Rate and Daily Market Rate, 1992-2009



# The Target Fed Funds Rate w/Channel System

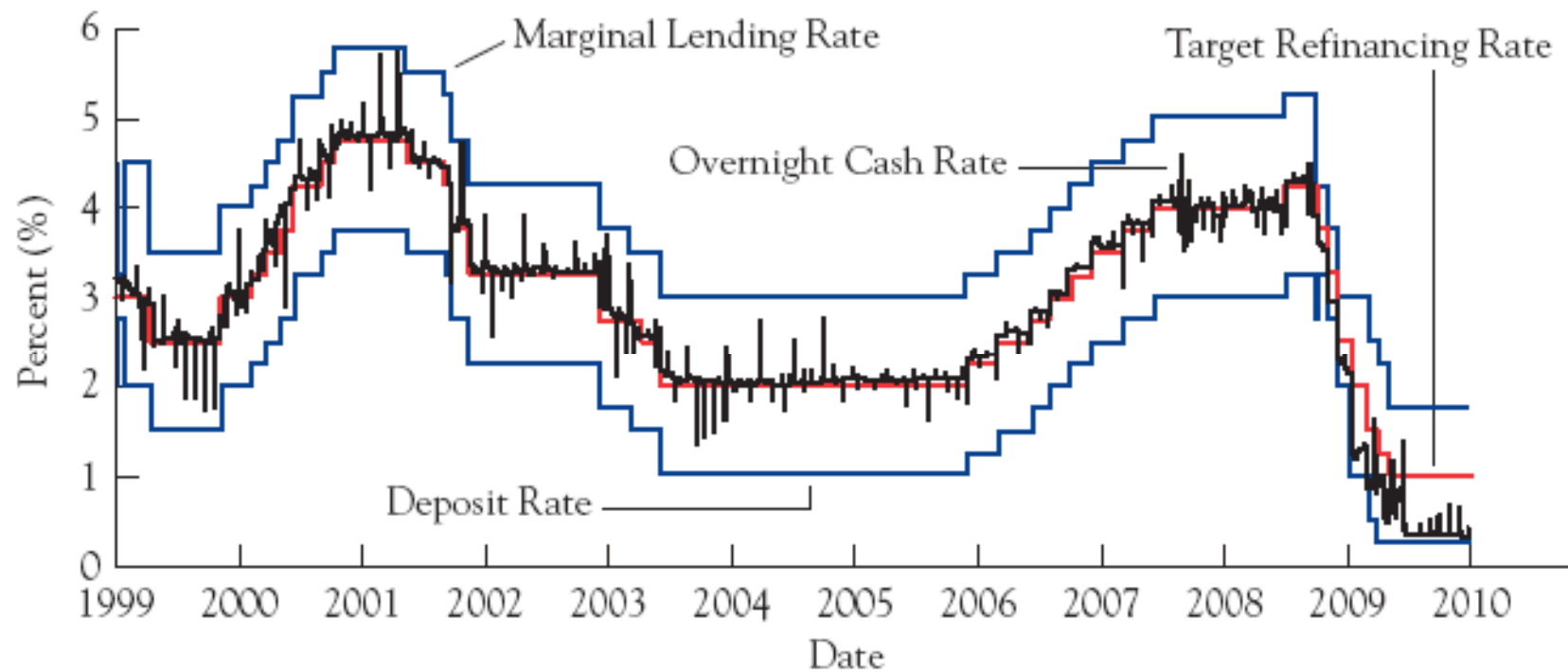
**Figure 18.5** The Channel System



# ECB Hitting Target Refi Rate

Figure 18.6

Euro-Area Overnight Cash Rate and ECB Interest Rates, 1999-2009



# Unconventional Policy Tools

**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: Purchases MBS, Operation Twist: LT Treasurys  
 Extended guidance

# Linking Tools to Objectives

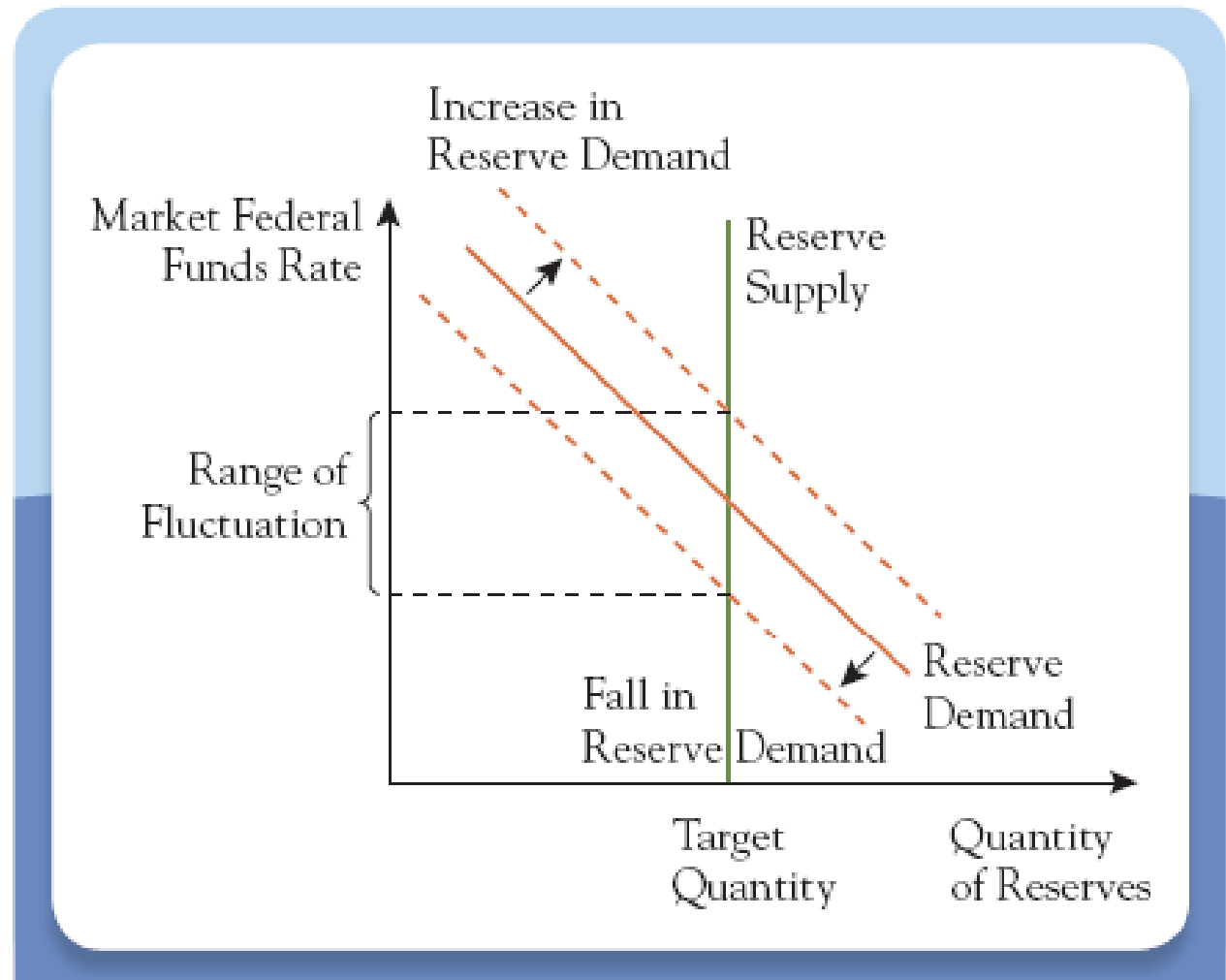
- A consensus has developed among monetary policy experts that:
  1. The reserve requirement is not useful as an operational instrument,
  2. Central bank lending is necessary to ensure financial stability, and
  3. Short-term interest rates are the tool to use to stabilize short-term fluctuations in prices and output.
- A good monetary policy instrument has three features:
  1. It is easily observable by everyone
  2. It is controllable and quickly changed.
  3. It is tightly linked to the policymakers' objectives.

# Desirable Features of a Policy Instrument

**Figure 18.7**

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

- A shift in reserve demand would move the market federal funds rate.
- Reserve targets make interest rates volatile.
- The federal funds rate is the link from the financial sector to the real economy.
- Targeting reserves could destabilize the real economy.





# Desirable Features of a Policy Instrument

- Interest rates are the primary linkage between the financial system and the real economy.
  - Stabilizing growth means keeping interest rates from being overly volatile.
- This means keeping unpredictable changes in the reserve demand from influencing interest rates and feeding into the real economy.
  - The best way to do this is to target interest rates.



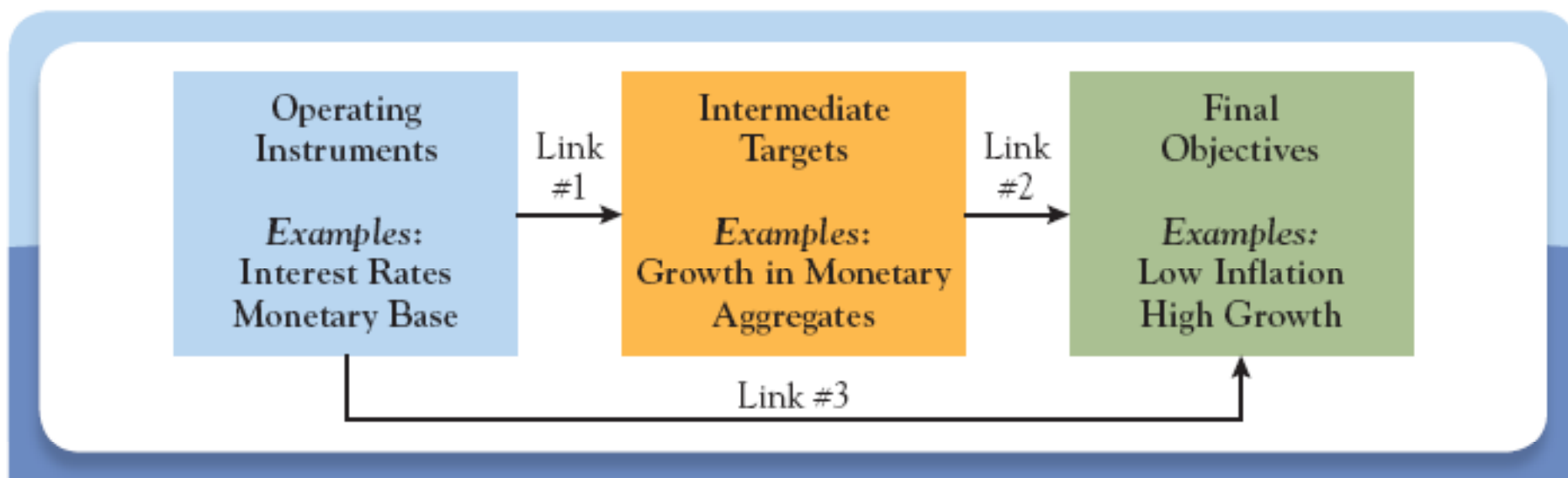
## APPLYING THE CONCEPT

### INFLATION TARGETING

- Inflation targeting bypasses intermediate targets and focuses on the final objective.
- Components:
  - Public announcement of numerical target,
  - Commitment to price stability as primary objective, and
  - Frequent public communication.
- Inflation targeting increases policymakers' accountability and helps to establish their credibility.
- The result is not just lower and more stable inflation but usually higher and more stable growth as well.

# Operating Instruments & Intermediate Targets

**Figure 18.8** Instruments, Targets, and Objectives



# Unconventional Policy Tools

- 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.

# Unconventional Policy Tools

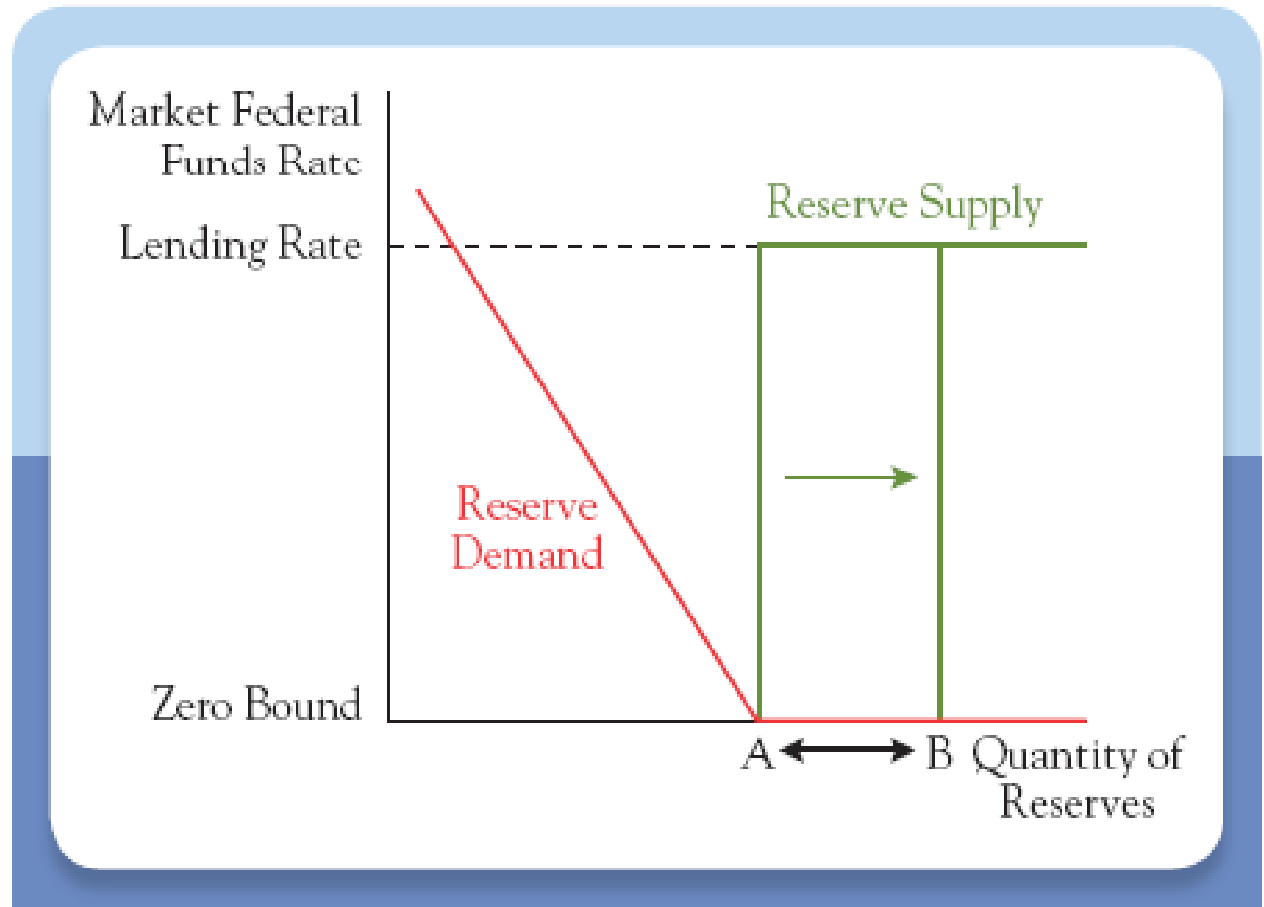
1. A policy duration commitment.
  - This is when the central bank promises to keep interest rates low in the future.
2. Quantitative easing (QE).
  - When the central bank supplies aggregate reserves beyond the quantity needed to lower the policy rate to zero.
3. Credit easing (CE).
  - When the central 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

- 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

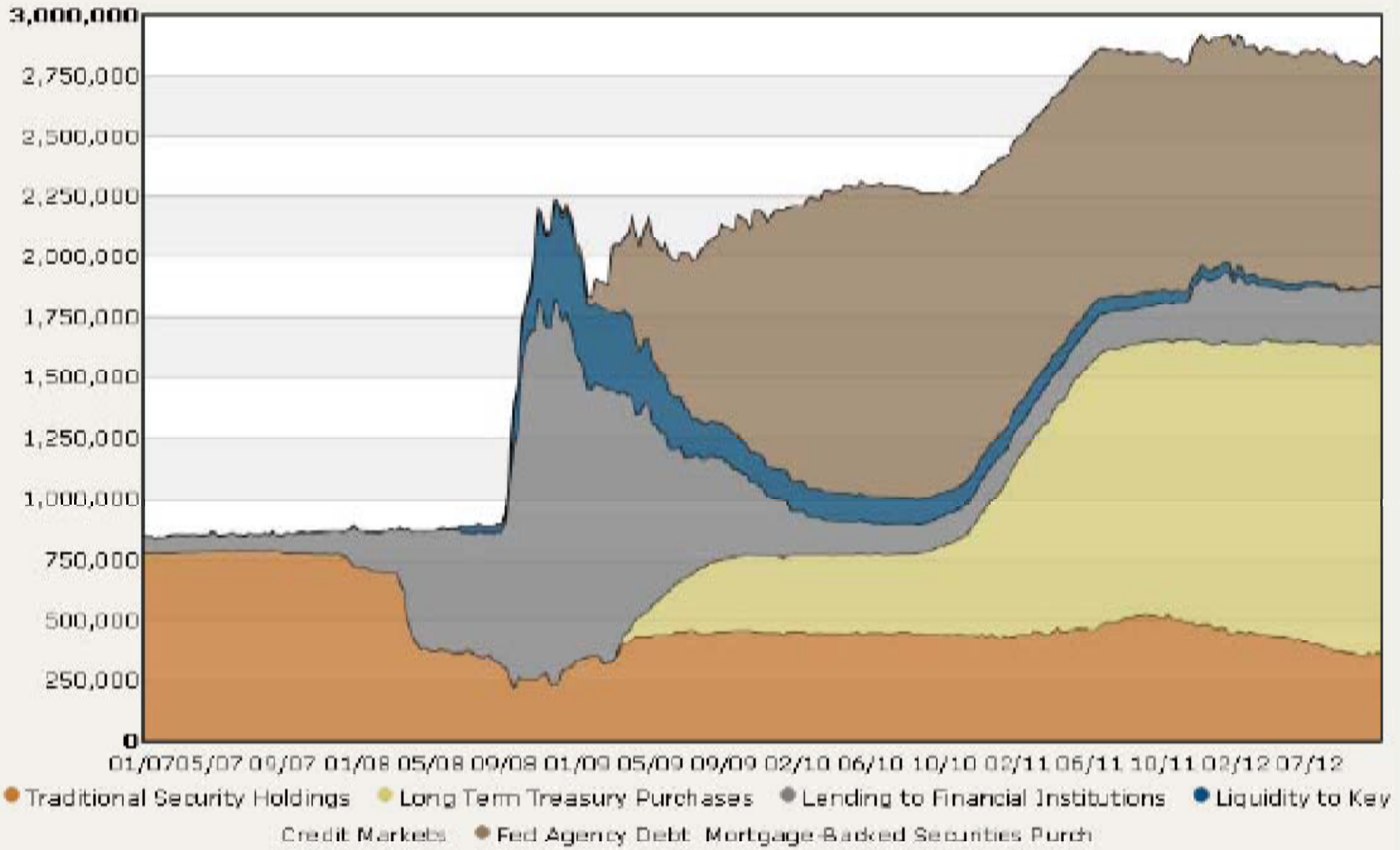
Quantitative Easing



# 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.

**SUMMARY VIEW**  
Millions of Dollars





# 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

- 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.

# Impact of QE(CE)1-3

**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, Laforte, 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).

# 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.

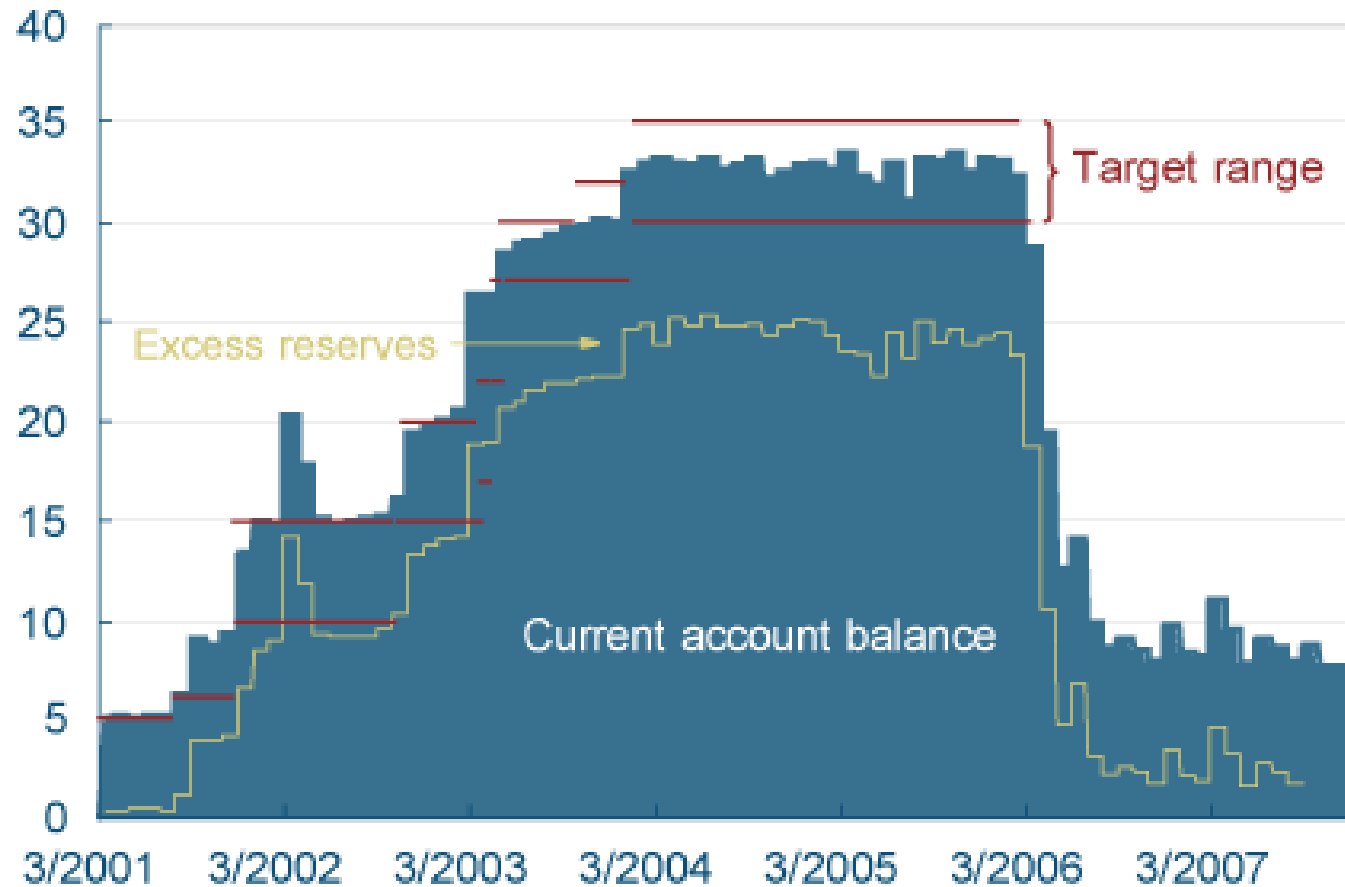
# Making an Effective Exit

- 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

## 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>

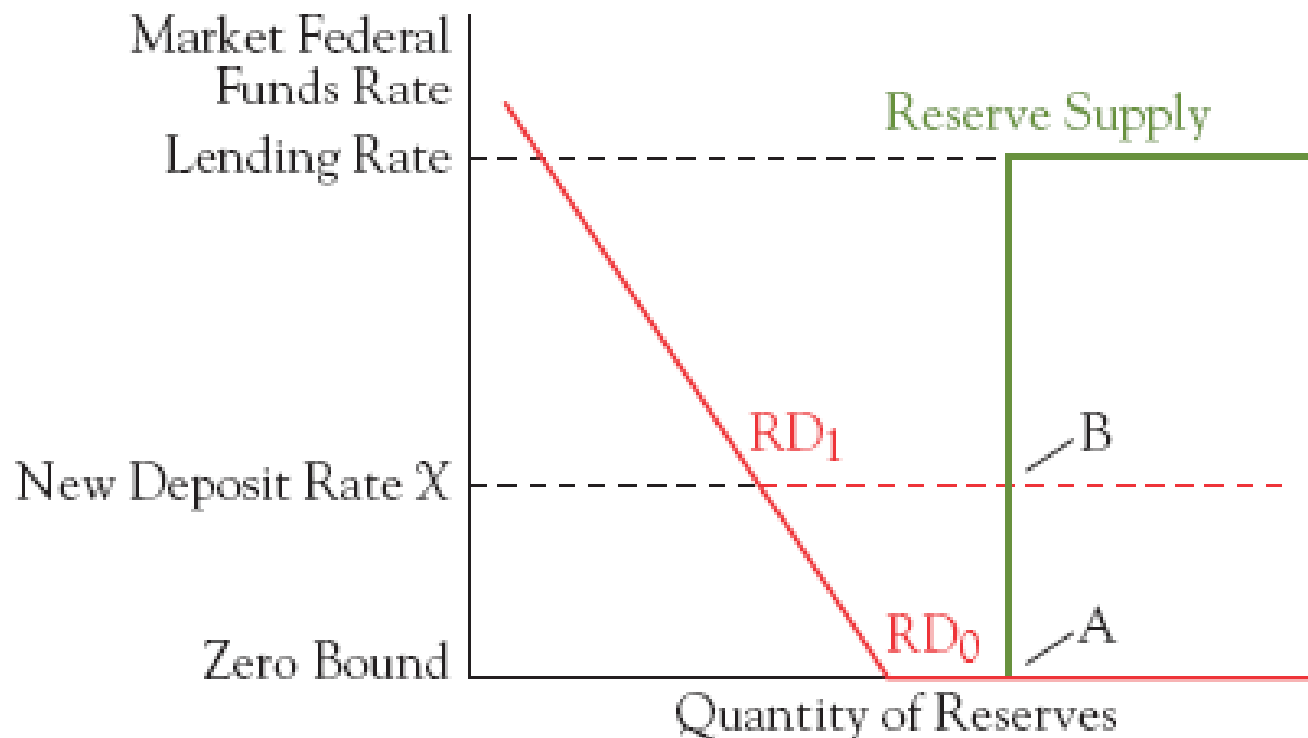
# Making an Effective Exit

- 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.

# Hyperinflation?

