

The Money Supply Process and Quantitative/Credit Easing

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 -\$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 (German government bonds in euros) +\$1 billion	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. Second Bank after American Steel's Deposit		B. Second Bank after Extension of a Loan	
Assets		Liabilities	
Reserves	+\$100,000	Reserves	+\$10,000
		Loan	+\$90,000
		American Steel's checking account	+\$100,000

C. Third Bank 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

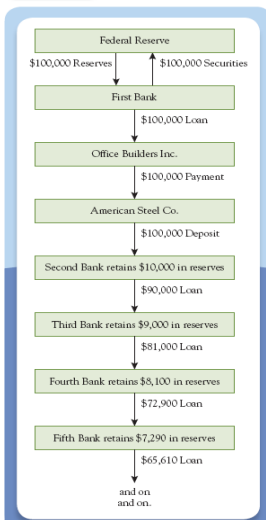


Table 17.3 Multiple Deposit Expansion following a \$100,000 Open Market Purchase Assuming a 10% Reserve Requirement

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?
Target Federal Funds Rate	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.
Discount Rate	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.
Deposit Rate	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.
Reserve Requirement	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

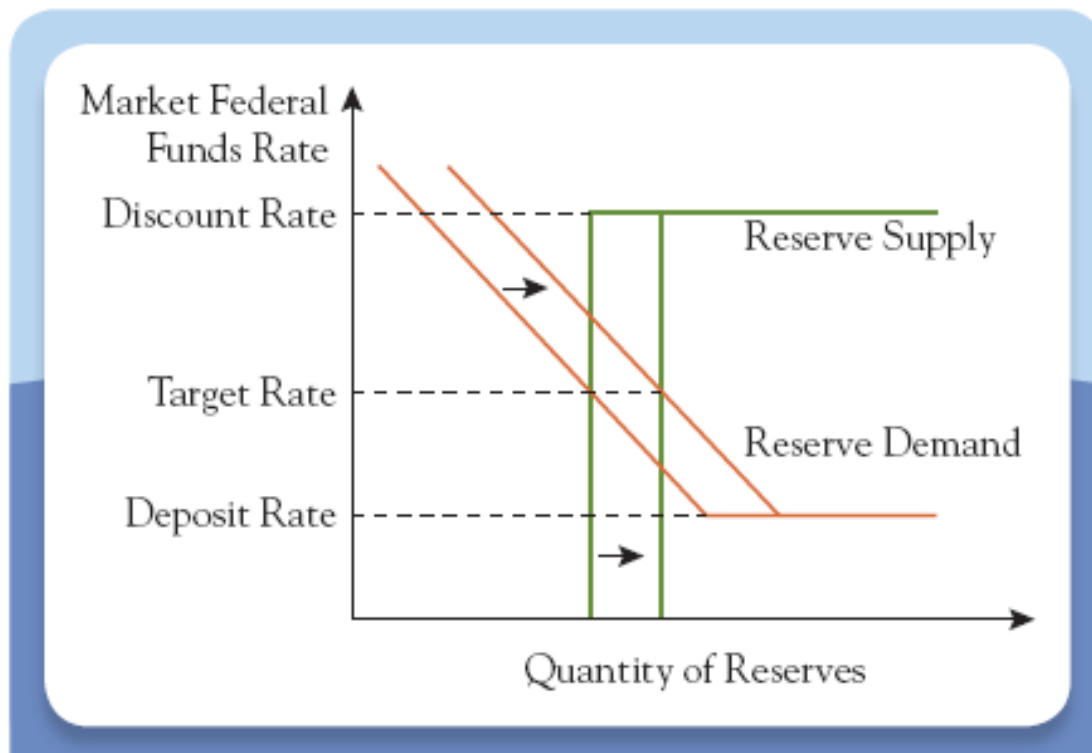


Figure 18.5 The Channel System

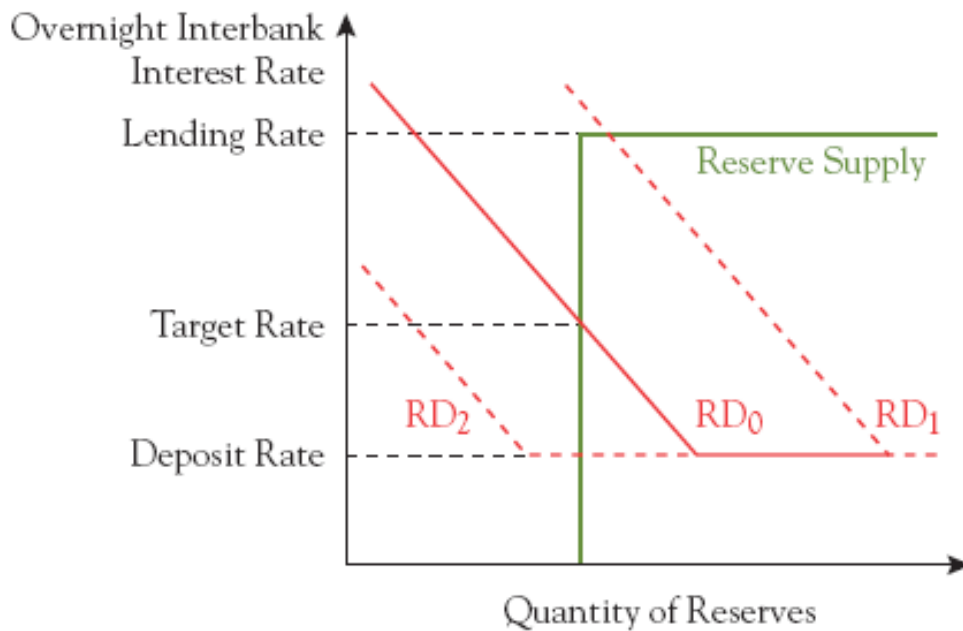


Table 18.2 Some Unconventional Policy Tools

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

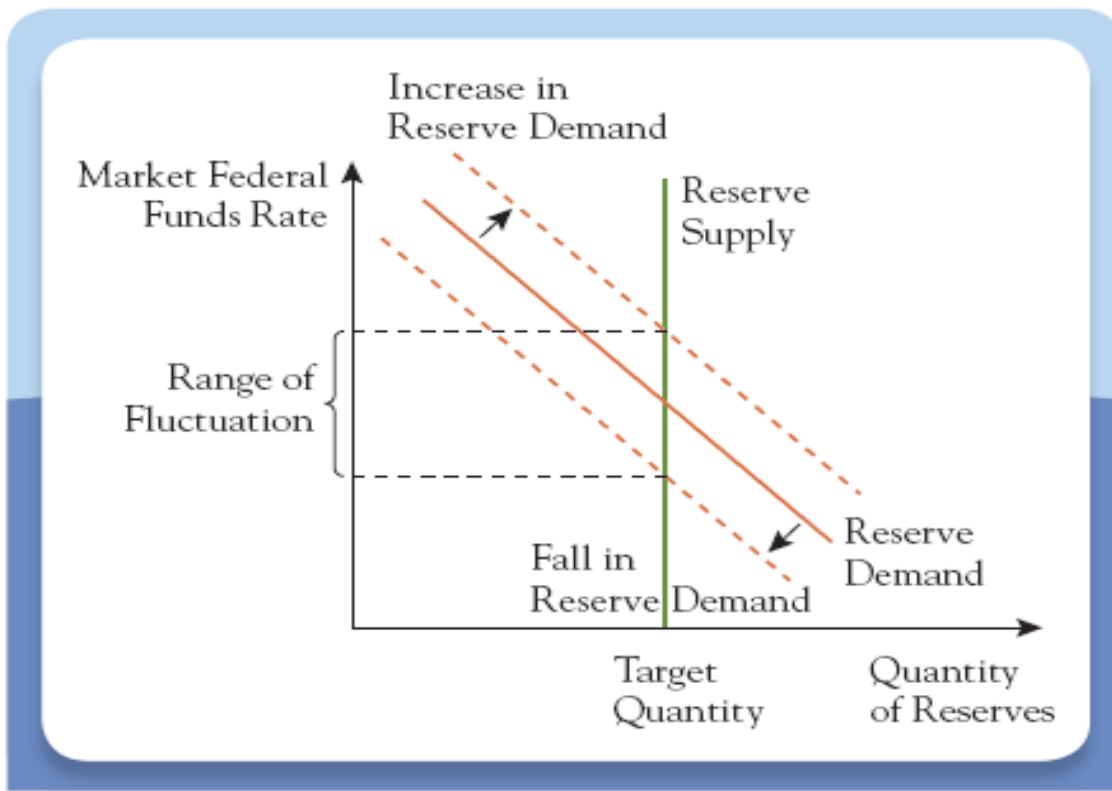
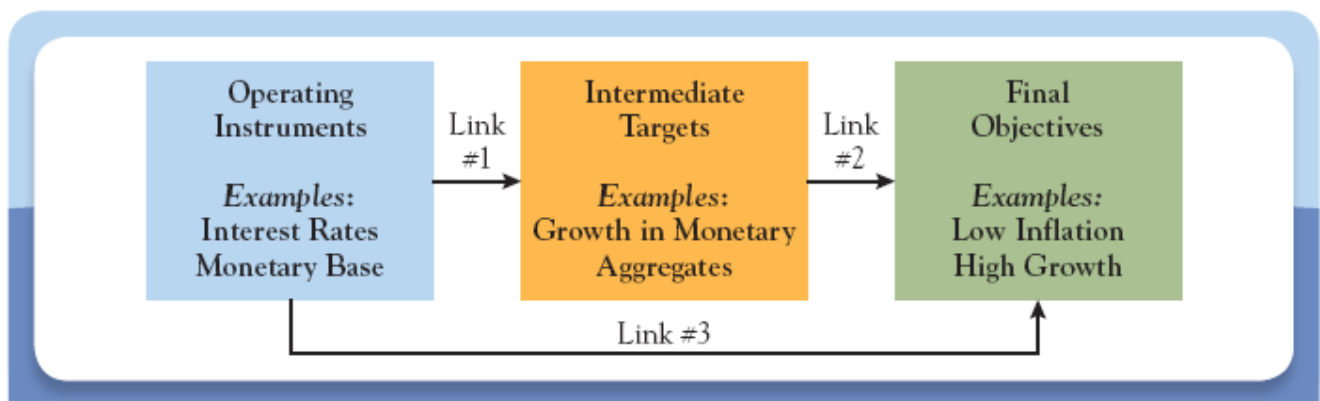


Figure 18.8

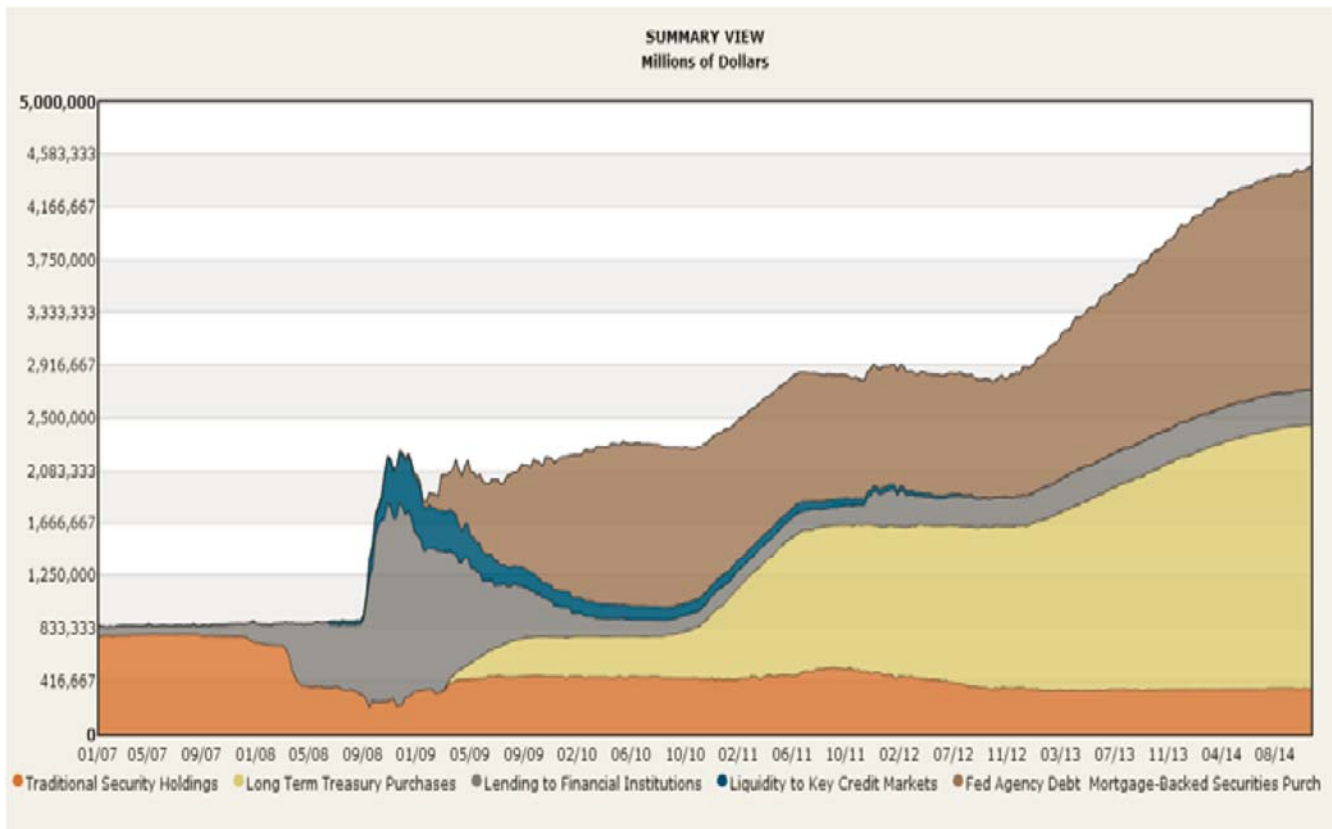
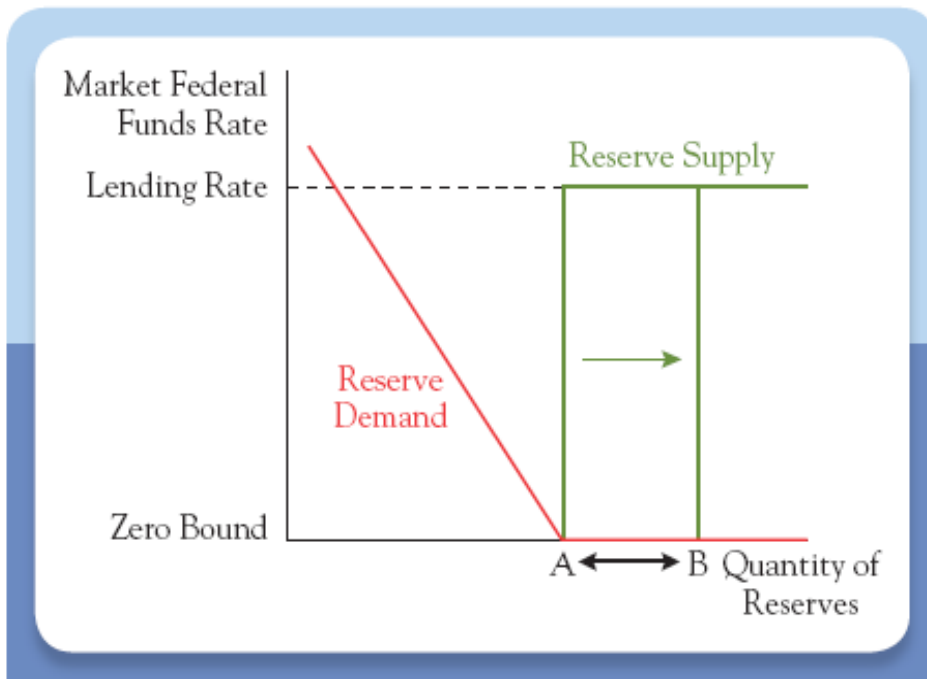
Instruments, Targets, and Objectives



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.

Table 5 – Maximum impact and statistical significance on real GDP

Model/ Additional variable included	Litterman I	Litterman II	Litterman III	Panel I	Panel II	Panel III	Average
Gov. budget balance (US)	0.31**	0.63**	0.60**	0.12**	0.57**	0.43*	0.44
Public debt (US)	0.15**	0.50**	0.44*	0.10*	0.50**	0.21	0.32
Euro Area spread (US)	0.21**	0.50**	0.52*	0.15**	0.57**	0.34*	0.38
Real oil price (US)	0.26**	0.72**	0.61**	0.17**	0.57**	0.41**	0.46
ECB balance sheet (US)	0.20**	0.52**	0.48**	0.10**	0.61**	0.43*	0.39

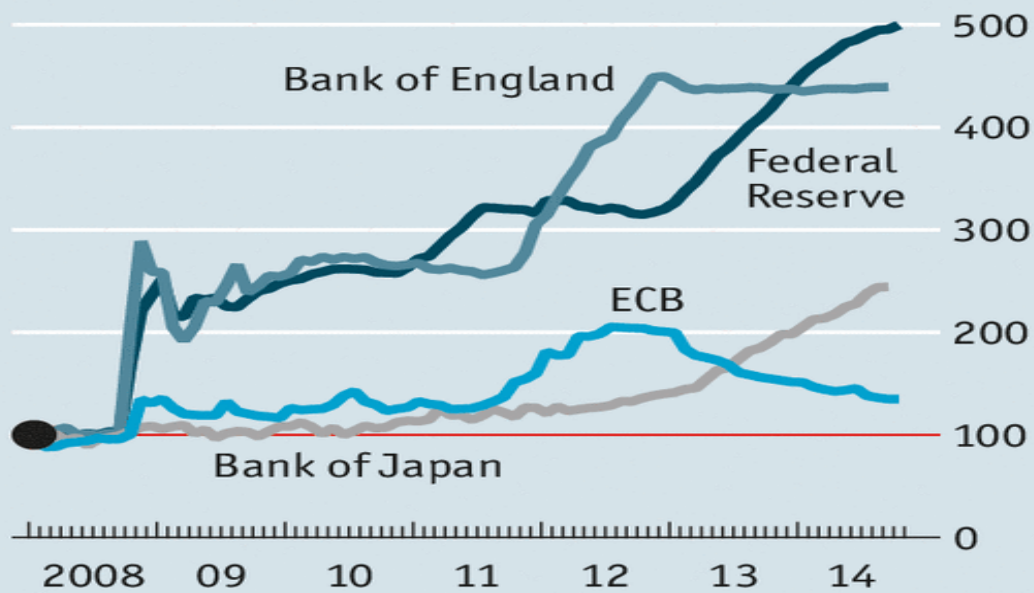
Note: Table shows maximum median effect on real GDP for the US/UK. Each column shows results from a different estimator and identification scheme. For example, 'Litterman I' means that the model was estimated subject to the Litterman prior and the asset purchase shock identified with a choleski decomposition scheme. Each row shows the effect of including a different control variable as the 6th variable in the VAR. In particular, 'Gov. budget balance' means that all models in that row have been estimated including the government budget balance to GDP ratio as an additional control variable. 'Public debt' means that all models in that row have been estimated including the public debt to GDP ratio as an additional control variable. 'Euro Area spread' means that all models in that row have been estimated including the Italian to German government bond spread on 10-year government bond yields as an additional control variable. 'Real oil price' means that all models in that row have been estimated including the natural logarithm of the real oil price, expressed in domestic currency (USD and GBP respectively) and deflated by the CPI, as an additional control variable. 'ECB Balance sheet' means that all models in that row have been estimated including the ECB's Total assets to Euro Area GDP ratio as an additional control variable. (US)/(UK) means that results for the US/UK are presented. **/* signifies statistical significance at 90 / 68 quantile bands.

Weale, Wieladek, "What are the macroeconomic effects of asset purchases?" Bank of England External MPC discussion paper No. 42 (April 2014)

<http://www.bankofengland.co.uk/research/Documents/externalmpcpapers/extmpcpaper0042.pdf>

Easing off

Central banks' balance-sheets
January 2008=100



Source: Thomson Reuters

<http://www.economist.com/news/finance-and-economics/21629215-ending-quantitative-easing-may-be-penny-wise-pound-foolish-early-retirement>

Figure 18.11

Exiting Quantitative Easing by Hiking the Deposit Rate

