

Practice Problem Answer Key

Consider a country with one bank, one household, and a Central Bank. The balance sheet items for each entity on 01/01/2012 are described below.

The Fed has:

- \$10,000 in T-bills
- \$21,500 in T-notes

The bank has:

- \$50,000 in T-bills
- \$1,000 in cash (notes only)
- deposit account at the Fed with \$30,000 in it

The household:

- a deposit account at the bank with \$5,000 in it
- \$500 in cash

a) (5 points) Construct balance sheets for the Fed, the bank, and the firm on 01/01/2012.

The central bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$10,000	Bank's deposits	\$30,000
T-notes	\$21,500	Currency	\$1,500
Total assets	\$31,500	Total liabilities	\$31,500

The bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$50,000	HH deposits	\$5,000
Deposits at the Fed	\$30,000		
Cash	\$1,000		
Total assets	\$81,000	Total liabilities	\$5,000

The household:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
Deposits at the bank	\$5,000		
Cash	\$500		
Total assets	\$5,500	Total liabilities	\$0

b) (4 points) The required reserve ratio (RR) is 15%. What are the bank's excess reserves?

$$\text{Total reserves} = \text{Cash} + \text{Deposits at the Fed} = \$1,000 + \$30,000 = \$31,000$$

$$\text{Required reserves} = \text{RR} \cdot \text{HH deposits} = 0.15 \cdot \$5,000 = \$750$$

$$\text{Excess reserves} = \text{Total reserves} - \text{Required reserves} = \$31,000 - \$750 = \$30,250$$

Answer: **\$30,250**

- c) (4 points) The household wants to buy a car that costs \$40,000. Since the household doesn't have this much money on hand, it has to take a loan from the bank. How much money does the central bank need to inject in the economy so the bank can provide such a loan to the firm?

The available loanable funds from the bank are the bank's excess reserves. The bank currently has \$30,250 available to lend. Since the household needs to borrow \$40,000, the Fed has to increase the bank's excess reserves by \$9,750.

Answer: **\$9,750**

- d) (5 points) On 01/02/2012 The central bank proceeds with buying the required number of securities (the number you found in part c) from the bank. **When it buys securities from the bank, it pays to the bank in cash.** Construct the balance sheets for the central bank, the bank, and the firm on 01/02/2012.

The central bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$19,750	Bank's deposits	\$30,000
T-notes	\$21,500	Currency	\$11,250
Total assets	\$41,250	Total liabilities	\$41,250

The bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$40,250	HH deposits	\$5,000
Deposits at the Fed	\$30,000		
Cash	\$10,750		
Total assets	\$81,000	Total liabilities	\$5,000

The household:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
Deposits at the bank	\$5,000		
Cash	\$500		
Total assets	\$5,500	Total liabilities	\$0

- e) (5 points) On the next day, the household comes to the bank to apply for the loan. The loan officer at the bank approves the application. The household immediately gets a loan for the required amount in cash. Construct the balance sheets for the central bank, the bank, and the household on 01/03/2012. Assume that the household doesn't buy the car until a week later.

The central bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$19,750	Bank's deposits	\$0
T-notes	\$21,500	Currency	\$41,500
Total assets	\$41,500	Total liabilities	\$41,500

The bank:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
T-bills	\$40,250	HH deposits	\$5,000
Deposits at the Fed	\$0		
Cash	\$750		
Car loan	\$40,000		
Total assets	\$81,000	Total liabilities	\$5,000

The household:

Assets		Liabilities	
<i>Item</i>	<i>value</i>	<i>Item</i>	<i>value</i>
Deposits at the bank	\$5,000	Cal loan	\$40,000
Cash	\$40,500		
Total assets	\$45,500	Total liabilities	\$40,000

f) (2 points) What are the bank's excess reserves on 01/03/2015?

$$\text{Excess reserves} = \text{Total reserves} - \text{Required reserves} = \$750 - \$750 = \$0$$

Answer: **\$0**