

Past-paper walk-through

Banking and the Expansion of the Money Supply ■ 4.4

eXercise

Questions in this set

- 2022 Set 1 Q2
- 2016 Q2
- 2014 Q2

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 2

2022 Set 1 ■ Q2

Assume that commercial banks must hold a minimum of 20% of their deposits as reserves. Now suppose that the central bank of the country sells 100,000 of government bonds to commercial banks.

- (a)** Calculate the maximum change and state the direction of change in the money supply as a result of the central bank bond sale. Show your work.
- (b)** Draw a correctly labeled graph of the money market and show the effect of the change in the money supply identified in part (a) on the nominal interest rate.
- (c)** Given the change in the money supply in part (a), if the velocity of money is constant, what will happen to the nominal gross domestic product? Explain.
- (d)** Based on the change in the nominal gross domestic product in part (c), what happens to the price level if the real gross domestic product is constant?

Solution 2

(a)

Mark scheme

- Maximum change in money supply = bond sale $\times$ money multiplier = $-\$100,000 \times (1/0.2) = -\$100,000 \times 5 = -\$500,000$ (a decrease of \$500,000). Show work: the money (deposit) multiplier = $1/\text{required reserve ratio} = 1/0.2 = 5$. 1 point for the correct answer (a decrease of \$500,000) with work shown and direction (decrease) stated.

Solution 2

(b)

Mark scheme

- Draw the money market: vertical money supply MS_1 , downward-sloping money demand MD_1 (axes: Nominal Interest Rate vertical, Quantity of Money horizontal), equilibrium at i_1 , Q_1 — 1 point. Shift MS_1 leftward to MS_2 (reflecting the decrease in the money supply from part a), producing a new equilibrium at a higher nominal interest rate i_2 ($i_2 > i_1$) and lower quantity Q_2 — 1 point. Total 2 points.

Solution 2

(c)

Mark scheme

- Nominal gross domestic product (nominal GDP = PY) will decrease.
Explanation: by the quantity theory of money, $MV = PY$; holding velocity (V) constant, a decrease in the money supply (M) causes nominal GDP (PY) to decrease proportionally. 1 point for the correct direction (decrease) with this explanation.

Solution 2

(d)

Mark scheme

- The price level decreases. Since nominal GDP (PY) decreased (from part c) and real GDP (Y) is held constant, the price level (P) must fall for the product PY to fall. 1 point for correctly stating that the price level decreases.

Question 2

2016 ■ Q2

2. The following is the balance sheet of First Superior Bank.

Assets		Liabilities and Equity	
Reserves	\$200	Demand deposits	\$2,000
Loans	\$1,800	Equity (net worth)	\$0

Assume that the required reserve ratio is 10 percent.

- (a) What is the dollar value of new loans that First Superior Bank can make? Explain.
- (b) Mr. Smith deposits \$100 of cash in a demand deposit account in First Superior Bank. Calculate the maximum amount of new loans that First Superior Bank can now make.
- (c) As a result of Mr. Smith's \$100 cash deposit, calculate the maximum change over time in each of the following in the banking system.

Question 2

- (i) Loans
 - (ii) Demand deposits
- (d) As a result of Mr. Smith's \$100 cash deposit, calculate the maximum change over time in the money supply.
- (e) Provide one reason why the actual change in money supply can be smaller than the maximum change you identified in part (d).
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Solution 2

(a)

Mark scheme

- First Superior Bank can make \$0 in new loans, because the bank has no excess reserves (it is already fully loaned up) before the new deposit is made.

Solution 2

(b)

Mark scheme

- Maximum new loans = $\$100 \times (1 - 0.10) = \90 . Working: with a 10% required reserve ratio, the \$100 deposit requires \$10 to be held as required reserves, leaving \$90 in excess reserves, which the bank can lend out in full.

Solution 2

(c)(i)

Mark scheme

- Maximum change in loans across the banking system = \$900 ($= \90×10).
Working: the money (deposit) multiplier is $1/\text{required reserve ratio} = 1/0.10 = 10$. Starting from First Superior Bank's \$90 in new loans, the multiplier process across the whole banking system produces a maximum total change in loans of $\$90 \times 10 = \900 .

Solution 2

(c)(ii)

Mark scheme

- Maximum change in demand deposits across the banking system = \$1,000 (= \$100 $\times$ 10). Working: the initial \$100 cash deposit expands through the banking system via the deposit multiplier of 10 ($1/0.10$), giving \$100 $\times$ 10 = \$1,000 in new demand deposits.

Solution 2

(d)

Mark scheme

- Maximum change in the money supply = $900 (= 90 \times 10)$. This equals the multiplied new loans from part (c)(i): the original 100 cash deposit is simply converted from currency into a demand deposit (no new money from the bank). The 90 in excess reserves being loaned out and multiplied through the banking system, i.e., $90 \times 10 = 900$.

Solution 2

(e)

Mark scheme

- The actual change in the money supply can be smaller than the \$900 maximum because the public may hold some of the new money as cash instead of redepositing all of it back into the banking system (a currency drain), and/or banks may hold excess reserves beyond the required amount instead of loaning out the full amount available — either behavior reduces the effective size of the money multiplier.

Question 2

2014 ■ Q2

The Federal Reserve can influence the supply of money.

(a)(i) Assume that the Federal Reserve targets a lower federal funds rate.

What open market operation can the Federal Reserve use to achieve the lower target?

(a)(ii) Given your answer to part (a)(i), what will happen to the price of government bonds?

(b) Using a correctly labeled graph of the money market, show the effect of the open market operation from part (a)(i) on the nominal interest rate.

(c) Assume that the Federal Reserve buys government bonds from commercial banks. Based only on this transaction, will the level of required reserves in the commercial banks increase, decrease, or remain the same?

(d) Another monetary policy action involves changing the discount rate. Define the discount rate.

Solution 2

(a)(i)

Mark scheme

- The Federal Reserve should conduct an open market purchase — buy government bonds (open market operations) — which injects reserves into the banking system, increases the money supply, and lowers the federal funds rate toward the new target. 1 point for stating the Fed buys government bonds (open market purchase).

Solution 2

(a)(ii)

Mark scheme

- The price of government bonds will increase. The Fed's purchases raise demand for existing government bonds, bidding their price up (consistent with the inverse relationship between bond prices and interest rates, since the Fed is engineering a lower interest rate). 1 point for stating that the price of government bonds increases.

Solution 2

(b) Mark scheme

- Draw a money market graph with the nominal interest rate on the vertical axis and quantity of money on the horizontal axis: a downward-sloping money demand curve (MD) and a vertical money supply curve at M_1 (MS_1), intersecting at nominal interest rate r_1 . The open market purchase from part (a)(i) increases the money supply, shifting the vertical money supply curve right from MS_1 (at M_1) to MS_2 (at M_2); the new equilibrium nominal interest rate r_2 is lower than r_1 . 1 point for a correctly labeled money market graph; 1 point for shifting the money supply curve right and showing a decrease in the nominal interest rate.

Solution 2

(c)

Mark scheme

- The level of required reserves in the commercial banks will remain the same (will not initially change). Buying bonds from commercial banks increases those banks' actual reserves (and hence their excess reserves), but required reserves are determined by the required reserve ratio applied to bank deposits, which this open-market transaction alone does not change. 1 point for stating required reserves are unaffected/remain the same.

Solution 2

(d)

Mark scheme

- The discount rate is the interest rate that the Federal Reserve charges commercial banks for (short-term) loans borrowed directly from its discount window. 1 point for this definition.