

**AP<sup>®</sup> MACROECONOMICS**  
**2007 SCORING GUIDELINES**

**Question 2**

**6 points** (1 + 1 + 1 + 1 + 2)

(a) 1 point:

- One point is earned for stating that the federal funds rate is the interest rate on short-term loans between banks.

(b) 1 point:

- One point is earned for stating that the Fed should buy bonds.

(c) 1 point:

- One point is earned for calculating the maximum change in loans, which is \$40 million.

(d) 1 point:

- One point is earned for stating that the nominal interest rate will fall.

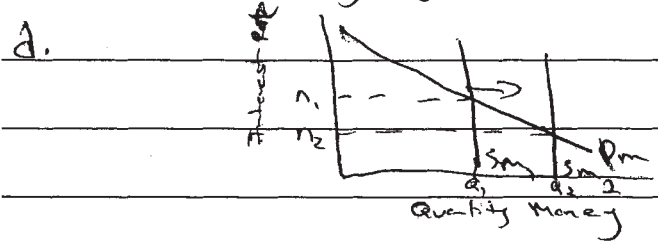
(e) 2 points:

- One point is earned for stating that the real interest rate will fall.
- One point is earned for explaining that the real rate falls because the nominal rate has decreased and inflation has increased.

a. The federal funds rate is the rate of interest that banks charge on loans to other banks in the Federal Funds Market.

b. To lower the federal funds rate, the Fed should buy securities. ~~sell~~

c. The monetary multiplier =  $\frac{1}{\text{reserve ratio}} = \frac{1}{0.2} = 5$ . If the Fed buys \$10 million in securities, then 20% of it must be kept <sup>required</sup> as reserves.  $\$10 \text{ million} \times 0.2 = \$2 \text{ million}$ , so \$2 million are the required reserves, and excess reserves equal  $\$10 \text{ million} - \$2 \text{ million} = \$8 \text{ million}$ . The banking system can lend a maximum amount of excess reserves  $\times$  monetary multiplier; thus, the banking system can lend a max. amount of  $\$8 \text{ million} \times 5 = \del{\$40} \$40 \text{ million}$ . The banking system can lend a maximum of \$40 million.



The supply of money increases from  $S_{m1}$  to  $S_{m2}$ . Nom. int. rate falls from  $r_1$  to  $r_2$ .

Buying securities increases the money supply, and therefore decreases the nominal interest rate.

e.  $\Delta \text{Real Rate Interest} = \Delta \text{Nom. Interest Rate} - \text{Inflation Rate}$   
 Based on the above equation, if <sup>the change in</sup> nominal interest rate is negative and the inflation rate is positive, then the change on the real interest rate will be negative, or the real interest rate will decrease if the Fed buys securities.

①

Write in the box the number of the question you are answering on this page as it is designated in the exam.

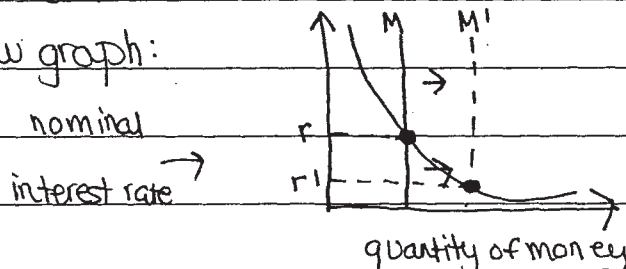
2B,

a) The federal funds rate is the rate at which banks can borrow from each other. For example, should a bank need extra reserves, it can borrow from another bank and the rate of interest will be the federal funds rate. Lowering the federal funds rate increases the money supply and raising the federal funds rate decreases the money supply.

b) If the Fed wants to lower the federal funds rate, they should buy bonds on the open-market. This will increase the money supply, encouraging banks to lower the federal funds rate because there is more money in the money supply.

c) If the open-market operation of buying bonds is equal to \$10 million and the reserve requirement is 0.2, the total change in the money supply will be \$50 million. However, because of the 0.2 reserve requirement, the maximum change in loans will only be \$40 million as banks are required to keep the other ~~\$10~~ \$10 million in ~~excess~~ <sup>required</sup> reserves.

d) Buying bonds increases the money supply and thus lowers the nominal rate of interest, as shown in the below graph:



Write in the box the number of the question you are answering on this page as it is designated in the exam.

question # 2

2

2B<sub>2</sub>

e) When inflation goes up, the real rate of interest will increase. The ~~term~~ term "real" simply means that the "rate of interest" is the nominal rate of interest adjusted for the inflation. Thus, when inflation goes up, the real rate of interest will also increase. For example, if there is a 5% <sup>increase</sup> change in inflation, the real interest rate will go up accordingly.

2 BF

Write in the box the number of the question you are answering on this page as it is designated in the exam.

2C

A) The Federal Funds rate is the interest rate charged to banks as they loan money from the Federal Reserve.

B) The Federal Reserve should buy open-market securities in order to compliment the lowering of the Federal Funds rate.

C) The maximum change in loans would equal two million dollars.

D) The purchase of open-market securities would lead to the decrease of the nominal interest rate.

E) In this case, the purchase of securities could cause an increase on the real interest rate ~~because~~ due to the unanticipated inflation.

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**Question 2**

**Overview**

The question assessed the students' understanding of the federal funds rate, the relationship between open-market operation and the federal funds rate, the effect of open-market operations on the nominal interest rate, and the relationship between the nominal interest rate and real interest rate.

**Sample: 2A**

**Score: 6**

The student earned all points in this question.

**Sample: 2B**

**Score: 4**

In part (e) the student incorrectly concludes that the real interest rate increases and fails to explain correctly, losing 2 points.

**Sample: 2C**

**Score: 2**

The student earned 1 point in part (b) for correctly identifying the open-market operation associated with lowering the federal funds rate. The student earned 1 point in part (d) for correctly identifying the effect of the open-market operation on the nominal interest rate.

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