

Introduction to Macroeconomics · 2017-18

Problem Set 1 · Multiple choice questions

- Which claim about the money multiplier process is not true?
 - More deposits give rise to more loans.
 - More loans give rise to more expenditure.
 - More expenditures give rise to more revenues.
 - More revenues give rise to fewer deposits.
- Which sequence represents the bank money creation process in the textbook model?
 - \uparrow deposits \Rightarrow \downarrow loans \Rightarrow \uparrow reserves \Rightarrow \uparrow deposits
 - \uparrow deposits \Rightarrow \uparrow loans \Rightarrow \downarrow expenditures \Rightarrow \downarrow revenues \Rightarrow \uparrow deposits
 - \uparrow deposits \Rightarrow \uparrow liquidity ratio \Rightarrow \uparrow money multiplier \Rightarrow \uparrow deposits
 - None of the above
- What is not a monetary aggregate?
 - M1**
 - The monetary base
 - M2**
 - The money multiplier
- M0** is defined as
 - currency held by the public minus bank reserves.
 - currency held by the public plus sight bank deposits.
 - sight bank deposits minus bank reserves.
 - currency held by the public plus bank reserves.
- An individual has a constant liquidity ratio l . Specifically, he has €1,000 in cash and deposits worth €2,000. While wandering around the streets, he finds a €20 banknote and a €1 coin. According to l which part of the €21 is held in cash and which part is deposited in a bank?
 - Cannot be determined
 - €10.5 are held in cash and €10.5 are deposited in a bank.
 - €14 are held in cash and €7 are deposited in a bank.
 - €7 are held in cash and €14 are deposited in a bank.
- Identify the sentence that is not false.
 - The money multiplier may be negative.
 - M2** is always smaller than **M1**.
 - M0** is always greater than **M1**.
 - None of the above
- What may leave the money multiplier unchanged, where l is the liquidity ratio and r is the reserve ratio?
 - l falls and r remains constant
 - l falls and r rises
 - l and r both fall
 - l and r both duplicate
- Which event does not reduce the money multiplier?
 - An increase in the liquidity ratio
 - An increase in the reserve ratio
 - An increase in the liquidity ratio combined with a decrease in the reserve ratio
 - None of the above
- If the monetary base is 100, **M1** = 1,000 and the liquidity ratio is 0.1,
 - the money multiplier cannot be calculated.
 - the reserve ratio must be zero.
 - the money multiplier is 10.
 - None of the above
- The money multiplier may remain constant if, being l the liquidity ratio and r the reserve ratio,
 - both l and r fall.
 - both l and r rise.
 - l declines and r does not change.
 - l goes down and r goes up.
- The money multiplier has decreased. A possible explanation is that
 - the liquidity ratio l has decreased.
 - the reserve ratio r has decreased.
 - liquidity and reserve ratios have not changed.
 - the liquidity ratio l has increased and the reserve ratio r has decreased.
- What variable is not a monetary aggregate?
 - M0**
 - The money multiplier
 - M1**
 - All of the above
- If **M0** remains constant and the cash held by the public diminishes, then
 - bank reserves must have been increased.
 - M1** also remains constant if the money multiplier has fallen.
 - M1** is twice **M0**.
 - It is impossible for **M0** to remain constant.

14. Which variable does not directly affect the money multiplier?

- (a) the liquidity ratio l .
- (b) the reserve ratio r .
- (c) the rate of growth of M_0 .
- (d) None of the above

15. What cannot be considered a financial asset?

- (a) A bank deposit
- (b) A government bond
- (c) A loan
- (d) None of the above

16. The difference $M_1 - M_0$

- (a) is known as the amount of bank reserves, R .
- (b) is equal to the total volume of deposits, D .
- (c) does not exist or has no meaning.
- (d) None of the above

17. The liquidity ratio is 0.4. The reserve ratio is 0.3. Which change in the reserve ratio duplicates the money multiplier?

- (a) 0.1
- (b) -0.1
- (c) Cannot be determined
- (d) None of the above

18. Sight deposits are $D = 100$. The bank reserves are $R = 20$. The money multiplier is 3. Then the cash E held by the public

- (a) is smaller than 30.
- (b) is larger than 40.
- (c) makes the liquidity ratio smaller than 0.1.
- (d) cannot be determined.

19. The liquidity ratio is four times the reserve ratio. The money multiplier is 2. It is then false that

- (a) $M_0 = 5 \cdot R$, where R is the banks' reserves.
- (b) the amount R of the banks' reserves can be determined.
- (c) the liquidity ratio is $2/3$.
- (d) cash in the hands of the public is four times R .

Problem Set 1 · Exercises

20. **Money multiplier.** Cash in the hands of the public is half deposits. The reserve ratio is half the liquidity ratio. If possible, find the money multiplier.

21. **M_0 , M_1 .** (i) Explain two differences between M_0 and M_1 . (ii) Can M_0 be greater than M_1 ? And smaller than M_1 ? And equal to M_1 ?

22. **M_1 , reserve ratio.** The liquidity ratio doubles the reserve ratio. The money stock M_1 is twice the monetary base M_0 . Find the reserve ratio if there is enough information to calculate it; if not, explain what information is missing.

23. **Cash.** The money multiplier is 2. Bank reserves are $R = 100$. Sight deposits are $D = 1,000$. Find the currency E held by the public.

24. **Monetary aggregates.** The monetary base is €37,000; bank reserves, €12,000; and the liquidity ratio, $1/10$. (i) Calculate the currency held by the public, M_1 , deposits, the reserve ratio and the money multiplier. (ii) Which change in the reserve ratio would increase M_1 by 10%? (iii) In (i), what is the effect on M_1 of a €2,000 increase in M_0 ?

25. **Money multiplier.** Calculate the money multiplier, the reserve ratio, the liquidity ratio, M_1 , the monetary base, and deposits if the amount of cash in the hands of the public doubles the reserves and deposits are twice the cash in the hands of the public.

26. **Reserve ratio.** (i) Let $M_0 = 1,000$, $M_1 = 4,000$ and $r = 0.1$. What change in the liquidity ratio l would neutralize the effect on M_1 of a 10% fall in M_0 ? (ii) Let $M_0 = 1,000$, $M_1 = 4,000$ and $l = 0.1$. What change in the reserve ratio r would offset the effect on M_0 of a 10% increase in M_0 ?

27. **Money multiplier.** Using derivatives, find the effect on the money multiplier of a rise in r and a fall in l .

28. **M_0 , M_1 .** Let $M_1 = 4,000$, $mm = 2$ and $r = 0.3$. (i) Find M_0 and l . (ii) Calculate M_1 if, given the results in (i), r dropped to zero. Explain the mechanism that produces the change in M_1 (reason what happens to loans, expenditure, revenues, deposits and M_1 when r becomes 0).

29. **M_0 , M_1 , M_2 .** (i) Can M_0 rise and, at the same time, M_1 drop? (ii) Can M_0 fall and, at the same time, M_2 rise?

30. **Money multiplier.** Find the money multiplier if the liquidity ratio is 0.1, the monetary base is 550, and the currency the public holds is 100.

31. **Cash and deposits.** Determine the amount of cash E and deposits D if the money stock M_1 equals 900 and the liquidity ratio is $1/2$.

- 32. Money multiplier.** Find the money multiplier if: (i) the liquidity ratio is 0.1, the monetary base is 500, and the money stock is 1,000; (ii) the liquidity ratio is 0.1, the monetary base is 550, and the currency E held by the public is 100.
- 33. Money creation process.** (i) Explain how an increase in unemployment is likely to affect the money multiplier process. (ii) Indicate three events that could lower the money multiplier. (iii) How is the money stock likely to be affected by an increase in the number of people that do not repay bank loans?
- 34. M0.** Calculate the monetary base if the money multiplier is $3/2$, reserve and liquidity ratios coincide and the currency the public holds is 150.
- 35. Currency and liquidity ratio.** If $M1 = 1,000$, $M0 = 500$, reserve ratio equals $3/8$ and deposits $D = 800$, find the liquidity ratio l and the currency E held by the public.
- 36. Reserve ratio.** With $M1 = 1,200$ and $M0 = 300$, find the reserve ratio if the reserve ratio is half the liquidity ratio.
- 37. M0.** Find $M0$ if $M1 = 1,200$, the reserve ratio is $1/10$ and the currency held by the public is 200.
- 38. Deposits and M0.** In the textbook model of money creation find the formula that expresses D in terms of $M0$ (and the rest of parameters).
- 39. Money multiplier process.** Name five variables involved in the money multiplier process.
- 40. Money multiplier.** Explain how the fact that currency has an expiry date (coins and banknotes newly issued are legal tender for just six months) is likely to affect the money multiplier.
- 41. Liquidity and reserve ratios.** (i) The money multiplier is 2. Deposits equal four times reserves. If possible, find the liquidity ratio. (ii) The money multiplier is 2, the monetary base is 1,000 and deposits amount to 1,500. If possible, find the reserve ratio; if it is not possible, explain why.
- 42. Money creation.** Explain how the money creation process and the money multiplier are likely to be affected by: (i) the voluntary rise by banks of their reserve ratio; (ii) the generalized use of mobile phones by consumers to make payments.
- 43. M1.** The monetary base is 200. The liquidity ratio is equal to the reserve ratio. Deposits are 400. If possible, find $M1$ and the money multiplier; if not possible, explain why.
- 44. Reserve ratio.** Find the reserve ratio if the monetary base is 350, deposits amount to 1,000, and the liquidity ratio equals $1/4$.
- 45. Money multiplier.** Explain the economic mechanism by means of which an increase in the liquidity ratio affects the money multiplier.
- 46. Reserve ratio.** Cash in the hands of the public is 100. Deposits amount to 600. With both deposits and the cash in the hands of the public remaining constant, the money multiplier has jumped from 2 to 4. If possible, find the change in the reserve ratio.
- 47. Money creation.** Initially, banks lend 100% of all the funds they could legally lend. How is the money creation process likely to be affected by the banks' decision of reducing the proportion of funds lent to 50%?
- 48. Money creation process.** (i) Show that, in the textbook model of bank money creation with unknown values for r and l , the final increment ΔD resulting for an increase $\Delta M0$ in the monetary base is given by the formula $\Delta D = \frac{1}{r+l} \cdot \Delta M0$. (ii) Determine the formula obtained from the previous one when $\Delta M0$ is replaced by $\Delta M1$.
- 49. Money creation process.** Explain how each of the next events is likely to affect the money multiplier process: (i) a half of the banking system goes bankrupt; (ii) firms and households decide to borrow from banks only 50% of what banks offer to lend; (iii) people double their liquidity ratio (from 0.2 to 0.4) and, at the same time, the reserve ratio is reduced from 0.4 to 0.3.
- 50. Money creation process.** Imagine that the central bank declares all banknotes no longer valid and that only coins can be used to make cash payments. How is this measure likely to affect the money creation process and the value of the money multiplier?
- 51. Money multiplier.** If possible, find the money multiplier if deposits D double the bank reserves R , cash E is one-fourth of $M1$ and $M0$ is twice E . If it is not possible, explain why not.