

Introduction to Macroeconomics · 2019-20

Problem Set 2 · Multiple choice questions

- Financial assets A and B differ only in two properties. Which one of the following sentences is more likely to be true?
 - If A is riskier than B , then B 's rate of return should be higher than A 's.
 - If A is less liquid than B , then A should be riskier than B .
 - If A 's rate of return is higher than B 's, then A should be more liquid than B .
 - None of the above
- Financial assets A and B differ only in two properties. Which of the following sentences is more likely to be true?
 - If A is as liquid as B , then B should be more profitable than A .
 - If A is riskier than B , then B 's rate of return should be higher than A 's.
 - If A is more liquid than B , then B should be riskier than A .
 - If A 's rate of return is smaller than B 's, then B should be less liquid than A .
- Financial assets A and B differ only in two properties. Which one of the following sentences is more likely to be true?
 - If A is more liquid than B , then B should be more profitable than A .
 - If A is less risky than B , then B 's rate of return should be same as A 's.
 - If A is less liquid than B , then A should be riskier than B .
 - If A 's rate of return is higher than B 's, then A should be more liquid than B .
- It is to be expected from a financial asset that, other things being equal,
 - the higher its liquidity, the smaller its risk.
 - the smaller its rate of return, the higher its liquidity.
 - the higher its risk, the smaller its rate of return.
 - None of the above
- Which sentence is highly unlikely?
 - A highly liquid financial asset with a high rate of return will be very risky
 - An almost riskless financial asset with a high rate of return will be highly illiquid
 - A highly liquid financial asset with a high rate of return will be almost riskless
 - None of the above
- Financial assets A and B , traded in a secondary market, differ only in three properties: liquidity, rate of return and risk. If A is more liquid than B
 - and B is more risky than A , then A 's rate of return should be smaller than B 's.
 - and B is less risky than A , then necessarily A and B should have the same rate of return.
 - and both A and B are equally risky, then A 's rate of return should be higher than B 's.
 - None of the above
- Two financial assets differ in exactly two properties. It is then to be expected that
 - the less profitable asset will be the less liquid.
 - the more liquid asset will be the less risky.
 - the riskier asset will be the less profitable.
 - the more profitable asset will be the riskier.
- Since firms cannot obtain from banks the amount of desired credit, firms sell all the T-bills they own. What measure by the central bank can offset the effect on the nominal interest rate caused by the sale of T-bills?
 - An increase in the reserve requirements
 - A rise in the central bank's discount rate
 - An expansionary open market operation
 - None of the above
- Pick the monetary policy tool of central banks.
 - The money multiplier
 - The reserve ratio
 - The total volume of bank deposits
 - All the monetary aggregates
- An example of a contractionary open market operation is
 - to decrease the reserve requirements.
 - to purchase financial assets.
 - to purchase foreign firms.
 - None of the above
- What is not true about an expansionary open market operation?
 - It is executed by the central bank.
 - In the liquidity market model, it is represented by a shift of the supply of liquidity function to the right.
 - It tends to cause an increase in the price of financial assets.
 - It causes an increase in the interest rate.

12. An expansionary monetary policy aims at rising
- the money stock.
 - the interest rate.
 - the foreign liquidity ratio.
 - None of the above
13. When the central bank buys financial assets,
- a rise in the interest rate is to be expected.
 - a fall in the interest rate is to be expected.
 - the money stock always remains constant.
 - the money multiplier automatically declines because both the liquidity ratio and the reserve ratio go down.
14. In the liquidity market model, what could not explain a rise in the interest rate?
- An increase in the budget deficit that has to be financed by issuing T-bills
 - An open market operation
 - A reduction of the number of banks combined with a rise in unemployment
 - An increase in the number of banks combined with a fall in the number of firms
15. The interest rate has dropped. A possible explanation is that
- there are more banks and fewer firms.
 - there are fewer banks and fewer firms.
 - there are fewer banks and more firms.
 - None of the above
16. What could explain a rise in both the interest rate and the amount of liquidity?
- An open market operation
 - An increase in unemployment
 - Neither (a) nor (d)
 - An increase in the number of banks combined with the issuing of T-bills by the government
17. The sale of financial assets implemented by the central bank
- tends to reduce the interest rate.
 - tends to reduce the money supply.
 - increases the money multiplier because it necessarily causes a fall in the liquidity ratio.
 - tends to raise the interest rate.
18. Which of the following is not a monetary policy instrument of a central bank?
- Open market operations
 - Reserve requirements
 - Interest rates set by the central bank
 - None of the above
19. When the central bank sells financial assets
- the interest rate tends to rise.
 - the interest rate tends to fall.
 - liquidity tends to grow.
 - the money multiplier increases because the sale of financial assets causes a rise in the reserve and liquidity ratios.
20. What decision by the central bank could offset the effect on the interest rate of a worsening in the expectations on the short-term evolution of the economic activity?
- The reduction in the reserve ratio
 - The reduction in the interest rate at which the central bank furnishes loans to the banks
 - The purchase of financial assets
 - None of the above
21. If the number of banks increases and the number of firms decreases, it is likely that the interest rate
- none of the following.
 - will necessarily remain constant.
 - will rise.
 - will fall.
22. Revenues from taxes are insufficient to cover the government expenditure. In the liquidity market model, what could neutralize the effect on the interest rate of the government deficit?
- A contractionary open market operation
 - That the most important banks go bankrupt
 - That firms sell financial assets they own to finance new investment projects
 - An increase in unemployment combined with the closure of 20% of all the factories
23. If the central bank executes an expansionary open market operation and, simultaneously, the government issues massively T-bills to finance an increase in the government expenditure, then interest rate
- necessarily rises.
 - necessarily falls.
 - only remains constant if nobody purchases the T-bills the government issues.
 - None of the above
24. Which event could cause a fall in the interest rate but not a rise?
- Having fewer banks and fewer firms
 - Having fewer banks but more firms
 - Neither (a), nor (b), nor (d)
 - Having more banks but fewer firms

25. A shift to the right of the supply of liquidity function combined with a shift to the right of the demand for liquidity function necessarily must cause
- a fall in the equilibrium amount of liquidity.
 - a rise in the equilibrium interest rate.
 - a fall in the equilibrium interest rate.
 - a rise in the equilibrium amount of liquidity.
26. How can a central bank increase the economy's liquidity (the money supply)?
- By selling financial assets in an OMO
 - By increasing the reserve ratio
 - By reducing the liquidity ratio
 - By purchasing financial assets in an OMO
27. The interest rate has fallen. What could not explain this result?
- That both the supply of liquidity and the demand for liquidity functions have shifted.
 - That only the supply function has shifted.
 - That only the demand function has shifted.
 - That the supply of liquidity function has shifted to the left and the demand for liquidity function has shifted to the right.
28. What could explain a fall in the interest rate?
- One of every three firms has closed down
 - The central bank has sold government bonds
 - The government budget deficit has risen
 - None of the above
29. The central bank can provide liquidity by
- conducting an open market operation in which the central bank sells financial assets.
 - raising the reserve requirements.
 - raising the people's liquidity ratio.
 - conducting an open market operation in which the central bank purchases financial assets.
30. When the central bank sells financial assets,
- the interest rate does not tend to decline.
 - M0** becomes larger than **M1**.
 - the money multiplier rises, since the sale raises the reserve ratio and lowers the liquidity ratio.
 - the interest rate does not tend to increase.
31. Which option lists at least two monetary policy instruments of the central bank?
- Reserve requirements, open market operations
 - Deposits, loans, money multiplier
 - Interest rates set by the central bank and liquidity ratio
 - None of the above
32. In which case could the domestic interest rate stay unaltered?
- A tax previously levied on loans and paid by borrowers is now removed and, simultaneously, the central bank executes a contractionary open market operation.
 - 50% of the domestic firms go bankrupt and unemployment surges.
 - Foreign banks settle new offices in the domestic economy while the government budget deficit doubles.
 - None of the above
33. What could not explain a fall in the interest rate?
- Having fewer banks when more firms are created
 - An expansionary open market operation executed when unemployment increases
 - An increase in reserve requirements when the central bank buys financial assets
 - Having more banks when reserve requirements are increased
34. In the liquidity market model, what could not in general explain a rise in the interest rate?
- A contractionary open market operation
 - A lowering of the reserve ratio
 - An increase in the government budget deficit
 - The bankruptcy of most banks
35. Which sentence is not true?
- The sale of financial assets can be considered an indirect demand for liquidity.
 - The purchase of financial assets can be considered an indirect supply of liquidity.
 - An expansionary open market operation shifts the supply of liquidity function to the left.
 - If the money multiplier is 4, then an additional unit in **M1** four additional units in **M0**.
36. The purchase of T-bills by a central bank
- is a contractionary open market operation.
 - causes a reduction in the monetary base.
 - exerts downward pressure on the interest rate.
 - None of the above
37. A contractionary open market operation
- aims at lowering the interest rate.
 - shifts the demand for liquidity function to the left.
 - is conducted by a central bank through by selling financial assets.
 - None of the above

38. What follows necessarily from a contractionary open market operation and the issuing of financial assets by firms to fund investment projects?
- A fall in the interest rate and a rise in the amount of liquidity
 - A rise in both the interest rate and the amount of liquidity
 - A fall in the amount of liquidity
 - None of the above
39. Banks have decided to increase the amount of loans they are willing to provide. What policy by the central bank neutralizes the effect on the interest rate of the banks' decision?
- A contractionary open market operation
 - An increase in the reserve requirements
 - A decrease in the interest rate at which the central bank lends to banks
 - None of the above
40. What event does not tend to rise the interest rate?
- A contractionary open market operation
 - An increase in the amount of financial assets that households would like to sell
 - An increase in the amount of reserves that banks are required to hold at the central bank
 - None of the above
41. The central bank purchases T-bills from banks. What happens to M_0 , M_1 and interest rate i ?
- M_1 and i go down, while M_0 goes up
 - M_1 and M_0 go down, while i goes up
 - M_1 and M_0 go up, while i goes down
 - None of the above
42. A reverse-repo conducted by the central bank
- is not a way of conducting an open market operation.
 - intends to drain liquidity from the economy.
 - is not a standing facility of a central bank.
 - None of the above
43. What could not explain an interest rate fall?
- Important banks go bankrupt and the central bank implements an expansionary open market operation
 - The government issues T-bills and the central bank reduces the reserve requirements
 - Firms increase the amount of financial assets they buy and households reduce the amount of financial assets they sell
 - None of the above
44. What could not explain a rise in the interest rate?
- A contractionary open market operation conducted at the same time as households sell T-bills.
 - A contractionary open market operation conducted at the same time as banks buy T-bills.
 - A contractionary open market operation implemented when the government reduces the amount of T-bills traditionally issued.
 - None of the above
45. The interest rate is likely to diminish when
- the central bank increases the level of reserves that banks must hold at the central bank.
 - the government substantially increases the issuance of government bonds and T-bills.
 - families reduce their liquidity ratio.
 - None of the above
46. A fall in the interest rate is not to be expected
- if the central bank drops to zero the amount of reserves banks must hold at the central bank.
 - if the government issues financial assets to finance a rise in the government budget deficit.
 - if households purchase more financial assets.
 - None of the above
47. Banks have decided to lend less money. What measure could neutralize the effect on the interest rate of the banks' decision to curtail lending?
- A contractionary open market operation
 - Cutting the interest rates set by the central bank
 - Lowering the amount of legal (or minimum) reserves
 - None of the above
48. What could not explain a fall in the interest rate?
- An expansionary open market operation
 - A reduction in the reserve ratio
 - A massive selling of financial assets
 - Foreign banks enter the domestic banking system
49. What could explain a reduction in the interest rate?
- A contractionary open market operation
 - A decrease in the reserve ratio
 - Banks implement a massive sale of financial assets
 - 25% of all the banks go bankrupt

50. A contractionary open market operation
- occurs when banks refuse to use the lending facility.
 - is exactly same thing as a decrease in the reserve requirements.
 - is defined as either a rise in the main interest rate set by the central bank or a purchase of financial assets by the central bank.
 - None of the above
51. The interest rate has risen. A possible explanation is that
- there are more banks and fewer firms.
 - there are fewer banks and more firms.
 - there are fewer banks and fewer firms.
 - None of the above
52. If the central bank conducts a contractionary open market operation and at the same time firms purchase more T-bills, the interest rate
- necessarily rises.
 - necessarily falls.
 - necessarily remains constant.
 - None of the above
53. What could justify both a rise and a fall of the interest rate?
- An expansionary open market operation
 - An increase in the reserve requirements
 - The combination of (a) and (b)
 - None of the above
54. What is the necessary effect of conducting a contractionary open market operation when firms issue financial assets to finance the construction of new factories?
- A fall in the interest rate
 - A fall in the amount of liquidity
 - A rise in the interest rate
 - None of the above
55. The interest rate
- falls if the government issues T-bills massively.
 - goes up if the central bank sells T-bills.
 - remains constant no matter what the central bank does.
 - None of the above
56. The interest rate corridor is
- a repurchase agreement (or repo transaction).
 - a lending facility and sometimes an open market operation.
 - not a deposit facility.
 - None of the above
57. Two financial assets, A and B, differ only in their risk and profitability. What is the most likely situation?
- If A is riskier than B, then B will be more profitable than A.
 - If B is not more profitable than A, then B is not riskier than A.
 - If B is less profitable than A, then A will not be riskier than B.
 - If A is less profitable than B, then the central bank conducts a contractionary open market operation to lower the interest rate, the money multiplier goes up, the liquidity rate goes down, the demand for liquidity function shifts to the left, the number of banks is reduced and the government issues T-bills to increase **M0**.
58. Which option lists, possibly in addition to other concepts, exactly one monetary policy tool, exactly two financial assets and exactly one monetary aggregate?
- T-bills, **M0**, central bank, the interest rate on the deposit facility, loans, liquidity ratio, deposits.
 - Money multiplier, **M1**, T-bills, €2 coins, open market operation, reserve requirements, demand for liquidity function, number of banks.
 - Liquidity ratio, money multiplier, risk of a financial asset, loans to consumers, loans to firms, standing facilities.
 - None of the above
59. What could not explain that the interest rate does not remain constant?
- A contractionary open market operation conducted at the same as the reserve requirements are reduced to zero.
 - An expansionary open market operation conducted at the same as the government massively issues T-bills.
 - The number of banks decreases and, simultaneously, corporations issue financial assets (corporate bonds, for instance) to finance new investment projects.
 - None of the above
60. In the liquidity market model, the interest rate
- does not rise if new T-bills are massively issued.
 - could remain constant if more banks are established and more firms created.
 - does not diminish if the central bank purchases financial assets.
 - None of the above

61. In which option the first concept listed is not directly related to each of the next three concepts?
- Financial asset, liquidity, profitability, risk.
 - Central bank, standing facility, open market operation, reserve requirements.
 - M1**, money multiplier, **M0**, maturity of a T-bill.
 - Demand for liquidity function, interest rate, households, government.
62. The supply of liquidity function has shifted to the left and the demand for liquidity function has shifted to the right. The most likely possible explanation is that
- foreign banks have been given permission to operate in the economy and, at the same time, a contractionary open market operation has been executed.
 - households have decided to buy massive amounts of financial assets and, simultaneously, the government has issued a large number of T-bills.
 - the central bank has conducted a contractionary open market operation and, expecting a future important increase in the interest rate, households and firms have anticipated the purchase of goods.
 - None of the above
63. Financial assets A, B and C differ only in two properties, liquidity and risk.
- If A is more liquid than B and C is more risky than A, then B and C should be equally liquid.
 - If A is more risky than both B and C, then B is necessarily less risky than C.
 - If A is less liquid than B and B is less liquid than C, then it is to be expected that C be more risky than A.
 - None of the above
64. The central bank has lowered the reserve requirements at the same time as foreign investors have decided to sell the domestic financial assets they own. What is the likely effect on the liquidity market equilibrium?
- The interest rate rises and the volume of liquidity falls.
 - The volume of liquidity increases and the interest rate could remain constant.
 - The volume of liquidity could remain constant but the interest rate necessarily diminishes.
 - None of the above
65. In every open market operation
- firms and private investors sell financial assets to the central bank.
 - the central bank purchases financial assets from banks.
 - banks sell financial assets to the government.
 - None of the above
66. As a rule, there is a negative relationship between
- the money stock and the monetary base.
 - the central bank and the banks.
 - the price of T-bills and the interest rate.
 - None of the above
67. What could not explain the simultaneous occurrence of a rise in the equilibrium interest rate and a rise in the equilibrium volume of liquidity?
- The central bank conducts an expansionary open market operation and the government buys financial assets.
 - The central bank conducts a contractionary open market operation and the government buys financial assets.
 - The central bank conducts a contractionary open market operation and the government sells financial assets.
 - None of the above

68 **Liquidity market model.** In the liquidity market model, ascertain the likely effect on the equilibrium interest rate and the amount of liquidity of each of the following events.

- (1) The arrival of a large number of immigrants
- (2) A significant number of factories close
- (3) There is an increase in the proportion of income saved by households
- (4) To finance important investment projects the main firms issue corporate bonds
- (5) The central bank executes an expansionary open market operation
- (6) More foreigners buy domestic financial assets
- (7) The population of the economy grows old
- (8) The banks refuse to lend to persons younger than 40-year old
- (9) Foreign banks enter the economy and settle new offices
- (10) Unemployment doubles
- (11) The inflation rate doubles
- (12) The inflation rate is expected to double
- (13) The central bank increases the level of reserve requirements and sells T-bills to banks
- (14) The central bank increases the reserve ratio and purchases T-bills from banks
- (15) The government budget goes from surplus to deficit
- (16) The stock market crashes
- (17) Unquestionable evidence that the afterlife exists is made public
- (18) Economic activity contracts (GDP falls)
- (19) Spain leaves the eurozone
- (20) (1) and (2) occur simultaneously
- (21) A bank run is believed to occur soon
- (22) The resale of T-bills is forbidden
- (23) A law is passed declaring tax-free the profits obtained from investing in T-bills

69 **Bank runs.** There are many instances of bank runs in the US economic history: 1819, 1837, 1857, 1873, 1893, 1907...

- (i) Explain, with the help of the liquidity market model, the effect of a bank run on the interest rate, stating clearly which function or functions shift and why.
- (ii) Suggest two monetary policy measures that could offset the effect of the bank run on the interest rate and indicate the function or functions that each measure modifies

70 **Money multiplier process, liquidity market, monetary policy.** Banks have voluntarily decided to increase their reserves substantially.

- (i) Explain the effect that this decision is likely to produce on the money multiplier process.
- (ii) By means of a graphical representation of the liquidity market, show the impact of that decision on the equilibrium interest rate.
- (iii) Suggest a measure by the central bank that could offset that impact and explain what would make the measure effective.

71 **New liquidity market model.** Consider the liquidity market model in which the supply of loans function is increasing up to a certain point (i', L') and, for each interest rate $i > i'$, the supply function becomes vertical at the value $L = L'$.

- (i) Draw this function. Draw also a standard demand for liquidity function such that the equilibrium interest rate i^* is higher than i' .
- (ii) Suppose that, for any shift to the right or to left of the supply of liquidity function, the resulting function remains vertical at L' , so the supply of liquidity cannot be higher than L' . Taking as initial situation the market equilibrium drawn in (i), analyze graphically the effect on the interest rate when an expansionary open market operation is conducted and indicate which functions are affected by the open market operation.

72 **OMOs.** The expression *Quantitative easing* (QE) refers to a policy by means of which a central bank buys assets (for instance, government bonds) mainly from non-bank financial companies (like pension funds and insurance companies). QE aims to increase private spending directly by circumventing the banking sector.

- (i) Is a QE programme essentially like an expansionary or a contractionary OMO?
- (ii) Analyze the effect of a QE programme on the interest rate using the liquidity market model.

73 **Liquidity market model.** (i) Find out the effect on the liquidity market equilibrium of:

- (a) a reduction in the government deficit;
 - (b) a reduction in the government deficit that occurs when the number of banks is reduced.
- (ii) Suggest an open market operation capable of neutralizing the effect on the interest rate established in (b) and illustrate your answer graphically.

74 Liquidity market model. (i) With the help of a graphical representation of the liquidity market model, determine and explain the effect on the equilibrium interest rate of an increase in the number of people that purchase financial assets.

(ii) Suggest two measures by the central bank that could neutralize that effect and indicate in a graphical representation of the market how these measures achieve the desired goal.

75 Rate of return. (i) Compute the rate of return of a €120 loan when only €80 are repaid.

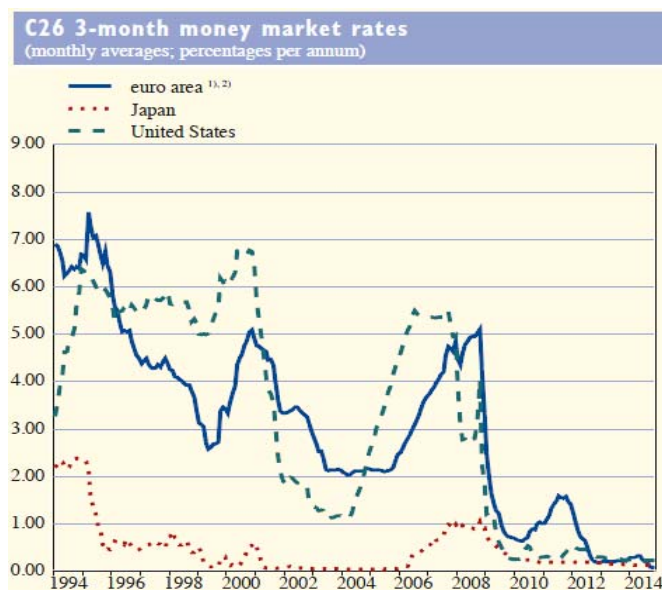
(ii) What if €80 are loaned and €120 repaid?

76 Liquidity market model. Analyze graphically the effect on the equilibrium interest rate in the liquidity market model of:

(i) a contractionary open market operation conducted when households are forced to sell most of the financial assets they own in order to pay pending debts;

(ii) an expansionary open market operation conducted when (a) the government issues T-bills to finance an increase in the government deficit and (b) foreign investors sell the domestic financial assets they own.

77 Liquidity market model. Over the two decades represented in the chart below, can monetary policy be considered, in all three economies, rather expansionary or contractionary?



ECB Monthly Bulletin, December 2014 (S43)

<http://www.ecb.europa.eu/pub/pdf/mobu/mb201412en.pdf>

78 Robin Hood tax. (i) Analyze graphically the effect on the interest rate of establishing a tax on the sales of existing financial assets. It is the sellers who must pay the tax. The central bank and the government are both tax-exempt. (ii) Suggest a monetary policy measure by the central bank that could neutralize the change in the volume of liquidity found in (i).

79 Equilibrium interest rate. (i) Explain the effect on the interest rate of a rise in the reserve ratio that occurs at the same time as a sale of T-bills by the central bank? (ii) What if the sale were a purchase?

80 Bubbles and monetary policy. A speculative bubble (market bubble or speculative mania) occurs when the price of a good or financial asset is systematically inflated with respect to what may be called its intrinsic or fundamental value. In this case, most of the trade in the market is carried out under the expectation that the price of the good or the financial asset will rise, so buyers typically buy expecting to be able to sell later at a higher price. A speculative bubble bursts when the price of the good or financial asset suddenly plummets (crashes). Explain why central banks generally respond to a stock market crash by conducting expansionary open market operations.

81 Liquidity market model. (i) By means of a graphical representation of the liquidity market model, determine and explain (en case separately) the effect on the interest rate of:

(a) placing a 10% tax on bank loans that has to be paid by borrowers;

(b) the prohibition of obtaining loans from other countries with the same currency (for instance, the Spanish government does not allow Spanish firms and citizens to borrow from French banks).

(ii) Suggest two measures by the central bank that could neutralize the effect on the interest rate in case (a) and show in a graphical representation how any of these measures achieves the goal.

82 Equilibrium interest rate. (i) Identify three events that may cause an increase in the equilibrium interest rate and three that may cause a fall in the equilibrium amount of liquidity.

(ii) Identify two events that may cause, at the same time, a fall in the equilibrium interest rate and a fall in the equilibrium amount of liquidity.

- 83 **Interest rate.** (i) May the nominal interest rate of an economy be persistently negative? What would that mean?
 (ii) Could it be persistently equal to zero?
 (iii) Can people be considered more patient when $i = 0$ than when $i > 0$?

84 **Liquidity market model.** Find all the equilibria interest rate if the demand for liquidity function is

$$L^d = \begin{cases} 8 - i & \text{if } 0 \leq i \leq 8 \\ 0 & \text{if } i > 8 \end{cases}$$

and the supply of liquidity is given by the expressions $i = 14 + 2 \cdot L^s$ if $L^s > 0$ and $L^s = 0$ if $0 \leq i \leq 14$.

85 **Central bank.** (i) Explain why the central bank cannot simultaneously control the interest rate i and the money stock $M1$. (ii) List three functions of a central bank.

86 **Interest rate.** A government announces a debt default: interest payments corresponding to the government's public debt will not be honoured for the next ten years. Explain and analyze graphically in the liquidity market model the effect of this announcement on the domestic interest rate.

87 **Liquidity market model.** In the first week of May 2015 the Danish government announced that it was planning to allow gas stations, clothing stores, and restaurants the option to stop taking cash payments. Explain how this measure would affect the money multiplier process and the money multiplier itself. <http://qz.com/399531/denmark-hopes-to-boost-its-economy-by-eliminating-cash/>

88 **Liquidity market model.** Initial situation: purchasers of financial assets have to pay a tax when purchasing financial assets, whereas the sale of financial assets is tax-free.

(a) Using the liquidity market model, explain and analyze graphically the effect on the equilibrium interest rate of each of the following events:

(i) the government removes the tax on purchasers of financial assets;

(ii) the government imposes a tax on the sellers of financial assets when selling financial assets.

(b) Indicate a monetary policy measure that could offset the effect on the interest rate when both (i) and (ii) occur.

89 **Liquidity market model.** Indicate how the following events are likely to modify the market functions (" \rightarrow " = shift to the right, " \leftarrow " = shift to the left) and the equilibrium interest rate i^* (" \uparrow " = goes up, " \downarrow " = goes down, " $=$ " = unaltered, " $?$ " = ambiguous or uncertain change), where S is the supply of liquidity function and D is the demand for liquidity function.

	S	D	i^*
The central bank conducts an expansionary OMO			
Households reduce the amount of financial assets bought			
The government issues T-bills			
Banks refuse to lend to firms and, to obtain funds, firms sell financial assets			
The central bank lowers the level of reserve requirements			
Lenders expect an immediate rise in the inflation rate but borrowers believe the inflation rate will not change			
Firms and households refuse to buy financial assets anymore			

90 **Liquidity market model.** A government anticipates its inability to pay its debt and, to give legal coverage to a probable default, the government passes a law according to which, in some circumstances, borrowers may choose not to repay their loans. Explain and analyze graphically in the liquidity market model the likely effect of this law on the equilibrium interest rate.

91 **Two economies.** There are two economies, A and B. In A the central bank conducts an expansionary open market operation. Analyze graphically by means of the liquidity market model how this operation would affect the interest rate in A and the interest rate in B.

92 **Liquidity market model.** Suggest events causing the shifts of the functions indicated below and specify the effect on the equilibrium interest rate (if the effect is not ambiguous).

(i) Supply of liquidity shifts to the left, demand for liquidity shifts to the right.

(ii) Supply of liquidity shifts to the right, demand for liquidity to the left.

(iii) Supply of liquidity shifts to the right, demand for liquidity fixed.

(iv) Supply of liquidity and demand for liquidity both shift to the left.

93 **M0 and OMOs.** The reserve ratio is 30%. The liquidity ratio, 1/5. The money stock, 24,000.

(i) Find the monetary base.

(ii) Explain what kind of OMO would increase (and explain how) the money stock by 48,000.

(iii) Calculate the amount involved in the open market operation.

94 **Italy 2016.** Banca Popolare and BPM merged in 2016 to create the then third biggest bank in Italy. The bank merger was intended to create a “larger, stronger, and more transparent” bank. Using the liquidity market model analyze, and explain, the impact on the equilibrium interest rate of a bank merger with the above characteristics.

<http://www.lavanguardia.com/economia/20160324/40654769221/italia-banca-popolare-bpm-fusion.html>

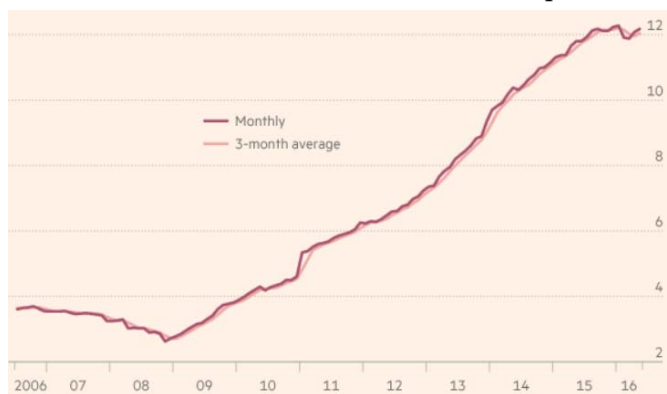
95 **OMO.** Explain if the following assertion is true or false: “A contractionary open market operation occurs when people or firms sell financial assets.”

96 **Open market operation.** Explain what an open market operation is, pick two macroeconomic variables affected by this kind of operation, and indicate how they are affected.

97 **Italian banking crisis, 2016.** The chart below shows the proportion of nonperforming loans in Italy. At the time, 2016, appeared to indicate the breaking down of the Italian banking system.

(i) Using the liquidity market model, analyze the impact on the equilibrium interest rate of an increase in the proportion of nonperforming loans in a banking system.

(ii) Suggest a monetary policy measure by the central bank that could neutralize that impact.



<https://www.ft.com/content/921dee0a-4737-11e6-b387-64ab0a67014c>

98 **Monetary policy.** (i) Explain four ways by means of which a central bank can increase liquidity. (ii)

Indicate something that an open market operation and the lending facility have in common and something that differentiates them. (iii) Why is a central bank unable to control at the same time the interest rate and **M1**? (iv) How are the concepts of financial asset and interest rate related?

99 **Liquidity market model.** (i) Explain, and analyze graphically by means of the liquidity market model, the effect on the equilibrium interest rate of a rise in the VAT (a tax that consumers pay when they buy goods). (ii) Identify a monetary policy decision by the central bank that could neutralize that effect on the interest rate.

100 **True or false.** Explain if the following claims are true or false.

(a) In the liquidity market model, the indirect supply of liquidity is represented by the purchase of financial assets.

(b) Financial asset A differs from financial asset B only in two properties, risk and liquidity. If A is less risky than B, then the most likely event is that B is less liquid than A.

(c) A contractionary open market operation changes the interest rate in the same direction as a reduction in the reserve requirements.

(d) The deposit facility is a financial asset that banks offer in the most favourable conditions to preferential clients.

(e) In the liquidity market model an expansionary open market operation (being a purchase of financial assets) is represented by a left-ward shift of the demand function.

(f) In the liquidity market model, if households sell financial assets massively, a rise is the most immediate likely effect on the interest rate.

(g) According to the liquidity market model, it is uncertain the effect on the interest rate of a contractionary open market operation executed when the government issues T-bills.

101 **Turkey, 2018.** In 2018, debt was one of the greatest threats Turkey faced. Two of Turkey’s largest companies were trying to re-organize \$12 billion in bank loans. Foreign debt of Turkish firms amounted to \$295 billion. International investors kept an eye on Turkish banks, as they wanted to know the quality of loans given and

whether loans were being repaid. In the stock market, the value of shares of Turkish banks continued to drop: at the time, their value was at a 9-year low. Despite all that, the government, corporations and banks refused to admit that there was any problem.
<https://learningenglish.voanews.com/a/turkey-economic-policies-cause-money-to-drop-value/4344103.html>

Explain, and analyze by means of a graphical representation of the liquidity market model, the effect on Turkey's interest rate of a massive selling by foreign investors of Turkish financial assets (such as debt issued by Turkey's government and shares of Turkish companies).

102 Liquidity market model. Economies A and B have the same currency.

(i) Use a graphical representation of the liquidity market model to find, and explain, the effect on the interest rates in A and B of the following: an expansionary open market operation is conducted in A, which is followed by capital flight from A to B (this capital flight takes initially the form of a sale of financial assets in A and next consists of a purchase of financial assets in B).

(ii) Explain whether an expansionary or a contractionary open market operation would be required in B to make the interest rate in B equal to the interest rate in A, taking into account the events described in part (i).

103 Argentina, 2018. On the 4th of May, 2018, the central bank of Argentina raised the interest rate to 40% (during the week it increased from 27.25% to 40%).

<https://www.ft.com/content/af31b784-4f6d-11e8-9471-a083af05aea7>

Using a graphical representation of the liquidity market model, explain how a central bank could cause an increase in the interest rate and indicate which functions, and how, would be affected.

104 Central bankers. The 2016 Forbes List of The World's Most Powerful People ranks, as number 6, the Chair of the US Federal Reserve (at the time, Janet Yellen) and, as number 11, the president of the European Central Bank (then and now, Mario Draghi). Why are central bankers considered so powerful?

<https://www.forbes.com/powerful-people/list/#tab:overall>

105 Liquidity market model. Denoting by i the interest rate, the supply of liquidity function is $q^s = 2 \cdot i$ and the demand for liquidity function is: $q^d = 12 - i$, if i is equal or smaller than 12; and $q^d = 0$, if i is larger than 12.

(i) Represent both functions graphically, calculate the market equilibrium and identify the equilibrium on the graphical representation.

(ii) If, by means of an open market operation, the central bank would like to set the equilibrium interest rate at value 3, should the open market operation be expansionary or contractionary? Calculate the amount of liquidity that the central bank must inject or absorb.

106 What is the name for...

(i) the difference between **M1** and cash in the hands of the public?

(ii) the sale of financial assets by a central bank?

(iii) the ratio between cash in the hands of the public and deposits?

107 Money withdraw. (11/01/19) “Yellow Vest protesters have urged supporters to withdraw their money from French banks en masse on Friday in a deliberate attempt to disrupt ‘the system’. Yet despite the threat, financial institutions appear unconcerned. (...) The goal is to maintain pressure on the government to heed Yellow Vest protesters' demands –in particular the right to propose and vote on new laws– by hitting them where it hurts: the economy. If every customer withdraws all the cash they have deposited with even a solvent bank at the same time, no financial institution has the sufficient funds to pay out to their clients. Yellow Vest protesters hope that if they can cripple at least one bank, it will have a knock-on effect. (...) Yet French banks remain unfazed by the proposal, as the amount necessary to have a negative impact exceeds the daily limits many banks in France allow clients to withdraw from ATMs. ‘There is very little chance it will work,’ FRANCE 24's business editor Christophe Dansette explained. ‘The amount of money French people have deposited in banks is estimated at €1.5 trillion, according to the Bank of France. Of this amount, €390 billion is currently (available). Every French person would therefore have to withdraw

€5,800. This is very difficult, if not impossible, considering that cash withdrawals from ATMs are limited'."

<https://www.france24.com/en/20190111-france-yellow-vest-protesters-call-run-banks-macron-economy-money-taxes-police>

(i) Using some model explained in class, explain why withdrawing massively money from banks would disrupt 'the system'.

(ii) Could you make sense in that model of the ineffectiveness of the invitation made by the protesters?

108 Liquidity market model. (03/04/19) "The six-member Monetary Policy Committee (MPC) of the Reserve Bank of India (RBI) is likely to cut short-term policy rate by 25 basis points in its first bimonthly review of FY20 on Thursday. Analysts believe easing inflation may give RBI room to address growth concerns of the economy. High-frequency macro data such as car sales, PMI and IIP numbers have been hinting at a slowdown in economic activity. After recording a high single-digit growth of 7.3 per cent in July 2018, the core sector has consistently recorded low single-digit growth. Moreover, several core sector industries have been showing wide variations in growth of late (...) El Nino conditions do not bode very well for India, which relies quite a bit on rains for its agriculture sector."

<https://economictimes.indiatimes.com/markets/stocks/news/rbi-may-cut-rate-soften-policy-stance-revise-gdp-forecast-4-things-to-watch-in-money-policy/articleshow/68703296.cms>

(i) Is cutting the interest rate policy rate an expansionary or a contractionary monetary policy? Justify your answer.

(ii) Explain why bad weather conditions and a slowdown in economy activity could justify lowering the interest rate.

109 Miscellany. (i) Indicate something that the lending facility and the deposit facility have in common and something that differentiates them.

(ii) What is an expansionary open market operation?

(iii) Explain what role the banks' reserves at the central bank play in the interbank payment system.

(iv) What is the interest rate corridor?

(v) Explain, and analyze graphically by means of the liquidity market model, the effect on the equilibrium interest rate of people believing that GDP (or the level of economic activity) is larger than the true GDP.

110 OMO. Explain if the following claim is true or false: 'In the liquidity market model, a contractionary open market operation followed by an expansionary open market operation necessarily changes the equilibrium interest rate.'

111 Liquidity. As regards the cartoon below:

(i) why more liquidity is supposed to be the solution to a financial crisis?;

(ii) who is supposed to provide that liquidity and to whom?

<https://ariesofwar.files.wordpress.com/2011/01/more-liquidity.jpg>



112 Two economies. Economies A and B have the same currency. Their liquidity markets are initially separated. The interest rate in A is higher than in B. Explain what is likely to happen to the interest rate, the supply of liquidity and the demand for liquidity in both A and B if the two liquidity markets fully integrate (financial flows between A and B are free and costless).

113 Stock market crash. Imagine that a technological war between China and the US sinks the value of Google (Alphabet) in the US stock market and that, as a consequence, the whole US stock market crashes.

(i) Explain (with the help of a graphical representation of the liquidity market model) the effect of the stock market crash on the interest rate.

(ii) Indicate two economic policy measures by the central bank that could neutralize that effect.

114 **Real and financial sectors.** Interpret the cartoon shown below. What is the suggested relationship between the real and the financial sector?



https://www.zerohedge.com/sites/default/files/images/user3303/imageroot/2013/11/20131117_itsallshit.jpg

Fed = US central bank

“Main street is a colloquial term used to refer to individual investors, employees and the overall economy. Main Street is typically contrasted with Wall Street, with the latter referring to the financial markets, major financial institutions and big corporations, as well as the high-level employees, managers and executives of those firms.”

<https://www.investopedia.com/terms/m/mainstreet.asp>