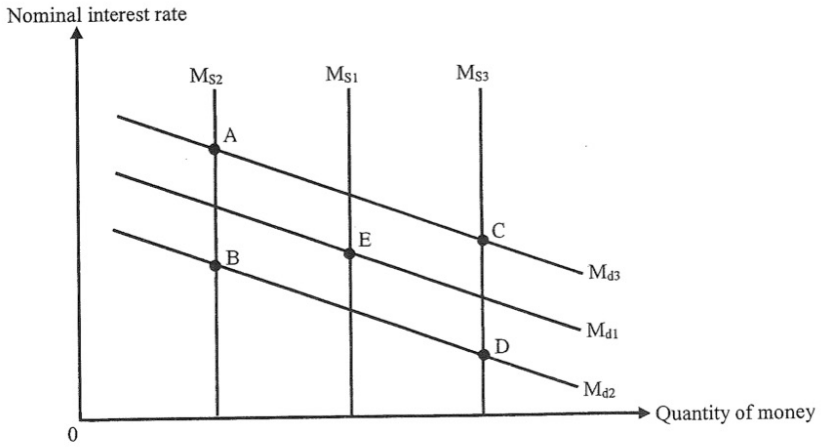
33. The diagram below shows the money demand and money supply curves of an economy. The original equilibrium point is at E.



Suppose most of the employers in the economy change the payment of salaries from monthly to bi-weekly. At the same time, the commercial banks tend to hold more excess reserves. The new equilibrium point will be at _____.

A. A
B. B
C. C
D. D

34. The following table shows the monetary base and money supply of a country.

Date	Monetary base ($ billion)	Money supply ($ billion)
1 January 2020	150	500
1 January 2021	150	800

Which of the following could explain the above data?

(1) The central bank bought bonds from the public in 2020.
(2) The central bank increased the discount rate in 2020.
(3) The central bank lowered the required reserve ratio in 2020.

A. (3) only
B. (1) and (2) only
C. (1) and (3) only
D. (2) and (3) only

35. The nominal interest rate on a one-year deposit is 1% and the inflation rate is 3%. The cost of holding cash is _____ and the real rate of return of holding cash is _____ .

A. 1% ..... -3%
B. 1% ..... -2%
C. 3% ..... -3%
D. 3% ..... -2%

6. (a) 'Deflation will occur if the amount of goods and services produced is growing faster than money supply.' Explain this statement in terms of the quantity theory of money. (4 marks)

(b) 'If deflation is expected, the real interest rate will be higher than the nominal interest rate.' Why? (2 marks)

8. The following table shows the balance sheet of a banking system.

Assets ($ million)		Liabilities ($ million)	
Reserves	1 000	Deposits	4 000
Loans	3 000		

The public initially holds $1 000 million cash and the banks are fully loaned up.

(a) Calculate the required reserve ratio. (1 mark)

(b) Suppose the public only wants to hold $400 million cash and deposits the remaining cash into the banks. Calculate the maximum change in money supply. Show your workings. (3 marks)

SECTION 5: MONEY AND BANKING (II)

5.1 MONETARY BASE (M0) AND MONETARY POLICY

Multiple Choice Questions

1994/AL/II/18
When the central bank buys government bonds from the non-bank public, the immediate impact on commercial banks is that the reserves are _____ the amount of the purchase.

A. increased by
B. increased by a portion of
C. decreased by
D. decreased by a multiple of

Study the following balance sheet of a banking system and answer questions 16 and 17.

Assets ($)		Liabilities ($)	
Reserves	4 000	Demand Deposits	8 000
Loans	3 000		
Investment	1 000		

1995/AL/II/16
Suppose the banking system has $2 000 excess reserves. When the central bank buys $2 000 worth of government bonds from the non-bank public, the excess reserves of the banking system would increase by

A. $0.
B. $1 000.
C. $1 500.
D. $2 000.

1995/AL/II/17
If the banks engage in credit creation after the purchase of government bonds by the central bank, which of the following statements will be true?

(1) The maximum amount of demand deposits will be $24 000.
(2) The loans will increase.
(3) The excess reserves will decrease.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. All of the above

1995/AL/II/28
Which of the following events will **NOT** increase the reserves of a commercial bank?

A. A customer deposits a cheque with the bank.
B. The central bank purchase a government bond from one of the bank's depositors.
C. The bank purchases a government bond from another commercial bank.
D. The bank borrows from the central bank.

1996/AL/II/19
The total amount of currency issued is $100 billion. Half is held by the non-bank public and half is held by commercial banks as reserves. Suppose the minimum reserve ratio is 20% and banks do not keep excess reserves, the money supply will be

A. $60 billion.
B. $100 billion.
C. $250 billion.
D. $300 billion.

For Question 15, consider the following balance sheet of a banking system.

Assets ($)		Liabilities ($)	
Reserves	3 000	Deposits	12 000
Loans	4 000		
Investment	5 000		

Suppose the banking system has $600 excess reserves, the public does not hold any cash and deposits all cash into the banking system.

1999/AL/II/15
Suppose the central bank sells $500 worth of government bonds to the commercial banks, the money supply in the economy will

A. decrease by $500.
B. decrease by $2 500.
C. remain unchanged.
D. increase by $500.

2001/AL/II/13
When the central bank purchases government bonds from the commercial banks,

A. the reserve of the banking system will decrease.
B. the required reserves of the banking system will decrease.
C. the banking multiplier will increase.
D. the maximum loan that the banking system can create will increase.

2002/AL/II/21
Study the following balance sheet of a banking system and answer question 21. Suppose the required reserve ratio is 25%.

Assets ($)		Liabilities ($)	
Reserves	3 000	Deposits	8 000
Loans	5 000		

Newly printed bank notes worth $400 are issued resulting in a $200 increase in cash held by the non-bank public and a $1 000 increase in the money supply. The total amount of excess reserves in the banking system will be

A. $800
B. $950
C. $1 000
D. $1 600

Study the following balance sheet of a banking system and answer Questions 19 and 20.

Assets ($)		Liabilities ($)	
Reserves	2 000	Deposits	10 000
Loans	7 000		
Investment	1 000		

2005/AL/II/19
Suppose the banking system does not hold any excess reserve. The immediate effect(s) of a withdrawal of $500 cash from the banking system is/are

(1) the reserve shortage is $100.
(2) the money supply remains unchanged.
(3) the monetary base remains unchanged.

A. (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2005/AL/II/20
After the credit contraction process is completed, the money supply will decrease by _____ and the monetary base will _____.

A. $1 500 ..... decrease by $500
B. $1 500 ..... remain unchanged
C. $2 000 ..... decrease by $500
D. $2 000 ..... remain unchanged

2007/AL/II/7
The monetary base will increase if

A. the central bank issues more banknotes.
B. the commercial banks hold more reserves.
C. the central bank reduces the required reserve ratio.
D. All of the above.

2011/AL/II/20
Which of the following will lead to a fall in monetary base?

A. a fall in the velocity of circulation of money.
B. an increase in the required reserve ratio
C. an open market sale of government bonds by the central bank.
D. All of the above

2014/DSE/I/33
Study the following information about an economy.

Monetary base	$500 billion
The coins and notes circulated in the public	$300 billion
Required reserve ratio	20%

If all the banks are fully loaned up, the amount of deposits will be _____.

A. $1 000 billion
B. $1 500 billion
C. $2 500 billion
D. $4 000 billion

2015/DSE/I/29
Study the following balance sheet of a banking system. The required reserve ratio is 20%.

Assets ($ million)		Liabilities ($ million)	
Reserves	300	Deposits	1 000
Loans	700		

If the central bank issues newly printed banknotes worth $200 million, the cash held by the non-bank public will increase by $100 million and the money supply will increase by $500 million. The total amount of excess reserves in the banking system will then be _____.

A. $100 million
B. $120 million
C. $280 million
D. $400 million

2015/DSE/I/32
The monetary base increases when

A. the commercial banks hold less excess reserves.
B. the commercial banks buy government bonds from the public.
C. the central bank buys government bonds from the public.
D. the central bank increases the discount rate.

2018/DSE/I/32
Refer to the following information about an economy.

Money supply	$35 000
Actual reserve ratio	25%
Excess reserves	$1150

Suppose the public always holds $12 000 cash. If all banks loan out their excess reserves and all the loans are re-deposited into the banking system,

A. the maximum possible amount of money supply will be $28 750.
B. the monetary base of the economy will be $16 600.
C. the maximum possible amount of loans will be $23 000.
D. the maximum banking multiplier will be 4.

1990/AL/II/03
The most feasible and frequently used instrument of monetary policy in Hong Kong is:

A. open market operations in foreign exchange
B. change in discount rates
C. variations in reserve requirements
D. moral suasion

1990/AL/II/04
Which of the following are pre-conditions for open market operations to be effective?

(1) There is a large stock of government securities.
(2) Commercial banks have a propensity to keep excess reserves.
(3) There is a well-developed securities market.
(4) There is a Central Bank.

A. (1), (2) and (3) only.
B. (1), (2) and (4) only.
C. (1), (3) and (4) only.
D. (2), (3) and (4) only.

1991/AL/II/23
Other things being equal, an open market sale of bonds by the central bank to the non-bank public will

(1) curb the credit creation power of the commercial banks.
(2) raise the market rate of interest.
(3) increase the amount of securities held by the commercial banks.
(4) lead to a fall in national income.

A. (1), (2) and (3) only
B. (1), (2) and (4) only
C. (1), (3) and (4) only
D. (2), (3) and (4) only

1992/AL/II/04
If the demand for money increases and the monetary authorities want the interest rate to remain unchanged, which of the following policies should be recommended?

A. raising the discount rate.
B. buying bonds in the open market.
C. raising the legal minimum reserve ratio.
D. None of the above.

1993/AL/II/16
Which of the following has a contractionary effect on the money supply?

A. There is an increase in the cash drain ratio.
B. There is a decrease in the rediscount rate.
C. There is a decrease in the legal reserve ratio.
D. The government buys bonds in the open market.

1996/AL/II/18
Which of the following are examples of contractionary policy?

(1) an increase in the tax rate
(2) a reduction in the discount rate
(3) a sale of government bonds by the central bank

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. All of the above.

1997/AL/II/08
Assuming banks are fully loaned up, the money supply will decrease when the government _____ bonds and _____ the reserve ratio.

A. sells ..... increases
B. buys ..... increases
C. sells ..... reduces
D. buys ..... reduces

1998/AL/II/17
Suppose the demand for money increases, other things begin equal, which of the following measures can stabilize the interest rate?

(1) a fall in the discount rate
(2) a fall in the required reserve ratio
(3) an open market sale of government bonds

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2000/AL/II/08
Suppose banks are fully loaned up. Which of the following will lead to a decrease in money supply?

(1) an increase in reserve ratio
(2) a reduction in the public's desire to hold cash
(3) an open market sale of government bonds by the central bank to the non-bank public

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2003/AL/II/12
A central bank can increase the money supply through

(1) an open market purchase of government bonds
(2) a reduction in the discount rate
(3) a drop in the required reserve ratio

A. (1) only
B. (1) and (2) only
C. (2) and (3) only
D. All of the above.

2004/AL/II/04
Which of the following are examples of an expansionary monetary policy?

(1) a reduction in the required reserve ratio
(2) an increase in discount rate
(3) an open market purchase of government bonds by the central bank

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2005/AL/II/17
A rise in the discount rate will

A. reduce the money supply because it increases the cash held by the public.
B. reduce the money supply because it reduces the reserves borrowed by commercial banks from the central bank.
C. increase the money supply because it raises the ability of commercial banks to create loans.
D. increase the money supply because it reduces the reserves held by commercial banks.

2006/AL/II/07
Which of the following may cause an increase in the money supply?

(1) Banks loan out their excess reserves.
(2) There is a decrease in the required reserve ratio.
(3) A commercial bank purchases government bonds from another commercial bank.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2007/AL/II/10
Which of the following are examples of a contractionary monetary policy?

(1) an open market sale of bonds by the central bank
(2) an increase in the discount rate
(3) a devaluation of domestic currency

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2010/AL/II/18
When the central bank sells government bonds to the public, _____ will increase.

A. the general price level
B. the interest rate
C. money supply
D. money demand

2012/AL/II/14
When the central bank keeps purchasing bonds from the market, which of the following is **LEAST** likely to occur?

A. The market interest rate will rise.
B. The real output level will rise.
C. The general price level will rise.
D. The asset price will rise.

2012/DSE/I/30
On-line shopping has become more popular, and hence people hold less cash for transaction purposes. Which of the following measures can be adopted by a central bank to reduce the effect of the above situation on the interest rate?

(1) an increase in discount rate
(2) an increase in required reserve ratio
(3) an open market purchase of government bonds

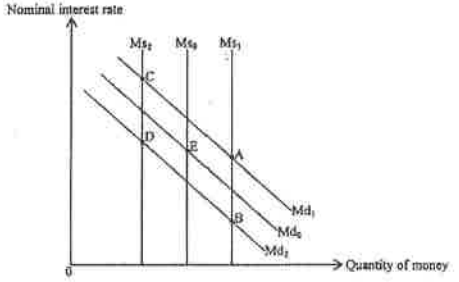
A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2013/DSE/I/28
An expansionary monetary policy is adopted in China when

(1) the Ministry of Finance (財政部) provides cash subsidies to agricultural workers.
(2) the People's Bank of China (中國人民銀行) reduces the required reserve ratio of all commercial banks.
(3) the Bank of China lowers its lending rate to small and medium-sized enterprises.

A. (1) only
B. (2) only
C. (3) only
D. (1), (2) and (3)

2017/DSE/I/32
The diagram below shows the money demand and supply curves of an economy. The original equilibrium point is at E.



Suppose the risk of holding interest bearing assets (such as bonds) increases and the central bank reduces the discount rate. The new equilibrium point will be at _____.

A. A
B. B
C. C
D. D

2017/DSE/I/37

Which of the following policies would most likely lead to a drop in aggregate output?

A. The government bought bonds from the public and raised the tax allowance at the same time.
B. The government sold bonds to the public and reduced transfer payment to the poor at the same time.
C. The government reduced required reserve ratio and raised the progressivity of income tax at the same time.
D. The government increased the discount rate and lowered profits tax rate at the same time.

2019/DSE/I/41

Study the following table.

Policy I	Policy II	Policy III
• an open market purchase of government bonds • a rise in the discount rate	• an open market purchase of government bonds • a rise in the salaries tax allowance	• a rise in the salaries tax allowance • a rise in the discount rate

Which of the policies in the above table is/are expansionary?

A. Policy I only
B. Policy II only
C. Policy III only
D. Policy I and Policy III only

2020/DSE/I/30

Refer to the following information about an economy. Suppose all banks do not hold any excess reserves.

	$ million
Currency in public circulation	10
Monetary base	30
Money supply	110

If the public deposits all the cash into the banking system,

A. the actual banking multiplier will be 4.
B. the maximum amount of loans will be $120 million.
C. the maximum amount of deposits will be $140 million.
D. the new money supply will be $160 million.

2020/DSE/I/32

Which of the following is a contractionary monetary policy?

A. an increase in the discount rate
B. an increase in the salaries tax rate
C. a decrease in the required reserve ratio
D. a decrease in the quota for migration

2021/DSE/I/34

Suppose the actual inflation rate and the nominal interest rate are -1% and 3% respectively. Which of the following statements are correct?

(1) The cost of holding cash is 3%.
(2) The expected real interest rate is higher than the nominal interest rate.
(3) The actual real rate of return on holding cash is 1%.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2021/DSE/I/35

Which of the following would offset the effect on aggregate output of an expansionary fiscal policy?

A. The public held more cash.
B. The use of electronic wallets became more popular.
C. The interbank rate decreased.
D. The government increased quota on the importation of foreign domestic helpers.

Short & Structured Questions

1994/AL/II/3

(a) Explain briefly how purchases of government bonds by the central bank would affect the money supply. (3 marks)

(b) If the reserve ratio is 0.2, what is the impact on the money supply if the central bank purchases bonds worth 1 million dollars? List **TWO** of the assumptions you have made in your calculation. (5 marks)

1996/AL/II/5(a)

Explain how the sale of government bonds by the central bank to the public affects the money supply. (4 marks)

2004/AL/II/1(c)

Name one similarity and one difference between each pair of the following terms.

monetary base (or high-powered money); money supply. (3 marks)

2007/AL/II/3(a)

What is meant by the monetary base? What is meant by the money supply? Why is money supply often a multiple of base money? When will the banking multiplier equal unity? (5 marks)

2008/AL/II/1(c)

Name one similarity and one difference between the following pairs of terms:

discount rate; interbank rate. (3 marks)

2012/DSE/II/13

The following table shows the balance sheet of the banking system of an economy.

Assets ($ million)		Liabilities ($ million)	
Reserves	500	Deposits	2 000
Loans	1 500		

Suppose the public does not hold cash and there are $100 million excess reserves in the banking system.

(a) Find the required reserve ratio. Show your working. (2 marks)

(b) Find the maximum possible amount of deposits if the banks are fully loaned up. Show your working. (2 marks)

(c) The central bank injects $200 million newly-printed banknotes into the banking system. If the banks lend out all of their excess reserves, what will the amount of money supply be in the economy? Show your working. (4 marks)

2013/DSE/II/12

The following table shows the balance sheet of the banking system of an economy.

Assets ($ million)		Liabilities ($ million)	
Reserves	400	Deposits	2 000
Loans	1 600		

The public holds $1 000 million cash and all banks are fully loaned up.

(a) Calculate the monetary base and the money supply in the economy. Show your workings. (4 marks)

(b) If the required reserve ratio is adjusted to 25%, calculate the new money supply in the economy. Show your workings. (2 marks)

2014/DSE/II/7(b)

In an attempt to reduce its growing fiscal deficits, the US government has tried to increase tax on the one hand and decrease fiscal spending on the other. But many worry that such a policy would give rise to undesirable side effects.

An alternative policy is to finance the fiscal deficits by printing money. Briefly discuss **ONE** advantage and **ONE** disadvantage of this alternative policy on the US economy as opposed to the above fiscal policy. (4 marks)

2014/DSE/II/12

The Prime Minister of Japan, Shinza Abe, adopted a series of policy measures in 2013 to expand the Japanese economy. One of the policy measures was stepping up the scale of the purchase of government bonds and other financial assets by the central bank.

(a) If the Japanese central bank purchases government bonds from Japanese commercial banks, explain whether the monetary base of Japan would be affected. (3 marks)

(b) Describe the process of deposit creation/contraction which may result from the purchase of government bonds by the central bank. Explain whether the process would further affect the monetary base of Japan. (5 marks)

2015/DSE/II/6

Study the following balance sheet of the banking system in Country A.

Assets ($ million)		Liabilities ($ million)	
Reserves	1 000	Deposits	5 000
Loans	4 000		

Suppose all banks are fully loaned up and never hold excess reserves. The public always holds $150 million in cash.

(a) Calculate the following items of this banking system:

(i) legal reserve ratio (1 mark)
(ii) money supply (2 marks)

A firm in Country A has received $50 million from abroad and deposited the sum of money into a bank.

(b) Calculate the new monetary base in Country A. Show your workings. (2 marks)

(c) Calculate the new money supply in Country A. Show your workings. (3 marks)

2016/DSE/II/8

The following is the balance sheet of a banking system.

Assets ($ million)		Liabilities ($ million)	
Reserves	1 000	Deposits	4 000
Loans	3 000		

Suppose the public always holds $500 million of cash and the banking system does not hold excess reserves.

(a) Calculate the monetary base and money supply. (2 marks)

The central bank increases the required reserve ratio to 50%.

(b) Calculate the change in monetary base and the change in money supply. Show your working. (4 marks)

(c) (i) Why is money supply often a few times more than monetary base? (3 marks)

(ii) Under what situation will money supply be equal to monetary base? (1 mark)

2018/DSE/II/7(a)
The following is the balance sheet of a banking system.

Assets ($ million)		Liabilities ($ million)	
Reserves	500	Deposits	2 000
Loans	1 500		

Initially the banks held $100 million excess reserves and the public held $100 million cash. Suppose the central bank buys $40 million worth of government bonds from the public.

(i) Calculate the new monetary base. Show your workings. (2 marks)

(ii) State **TWO** assumptions under which the actual change in money supply would equal the maximum possible change in money supply. (2 marks)

(iii) Calculate the maximum possible change in money supply. Show your workings. (4 marks)

MARKING SCHEME

1994/AL/II/18 A	2005/AL/II/19 C (55%)	1990/AL/II/03 A	2000/AL/II/08 B	2012/DSE/I/30 A (51%)
1995/AL/II/16 C	2005/AL/II/20 D (56%)	1990/AL/II/04 C	2003/AL/II/12 D	2013/DSE/I/28 B (43%)
1995/AL/II/17 D	2007/AL/II/7 A (30%)	1991/AL/II/23 B	2004/AL/II/04 B (74%)	2017/DSE/I/32 A (61%)
1995/AL/II/28 C	2011/AL/II/20 C (66%)	1992/AL/II/04 B	2005/AL/II/17 B (77%)	2017/DSE/I/37 B (66%)
1996/AL/II/19 D	2014/DSE/I/33 A (70%)	1993/AL/II/16 A	2006/AL/II/07 A (84%)	2019/DSE/I/41 B
1999/AL/II/15 C	2015/DSE/I/29 B (43%)	1996/AL/II/18 B	2007/AL/II/10 A (63%)	2020/DSE/I/30 B
2001/AL/II/13 D	2015/DSE/I/32 C (64%)	1997/AL/II/08 A	2010/AL/II/18 B (73%)	2020/DSE/I/32 A
2002/AL/II/21 C (29%)	2018/DSE/I/32 C (40%)	1998/AL/II/17 A	2012/AL/II/14 A (64%)	2021/DSE/I/34 B
2021/DSE/I/35 A				

1994/AL/II/3
(a) When the government purchases bonds from the market, it increases the reserves of commercial banks, the lending ability of the latter (through the banking multiplier) and hence the money supply.

(b) With the reserve ratio at 0.2, 1 million dollars of additional reserves can back up a loan of 5 millions. Thus the money supply increases by an amount of 5 million.

In the calculation, we have assumed that banks are fully loaned up and there is no cash leakage.

1996/AL/II/5(a)
As the public buy government bonds, the reserves in the commercial banks are reduced. Assuming that the banks are fully loaned up, their credit creation power is reduced and less loan can be made. The money supply falls.

2004/AL/II/1(c)
S: Monetary aggregates, both including currency (banknotes and coins) held by the non-bank public.
D: M0 (currency + reserves) vs. M1 / M2 / M3 (currency + deposits).

2007/AL/II/3(a)
The monetary base (or high-powered money) is the sum of currency held by the non-bank public (C) and reserves (R, deposits of commercial banks at the central bank plus vault cash).

The money supply is the sum of currency in circulation (C) and bank deposits (D).

Money supply is often a multiple of base money because, under fractional reserve banking, commercial banks are only required to keep a fraction of their deposits as reserves and are thus able to use their excess reserves to generate further deposits through their loan and portfolio investment activities.

The banking multiplier equals unity when commercial banks keep 100% reserves against their deposits.

2008/AL/II/1(c)

S: interest rates charged on short-term loans to commercial banks;
D: rate set by the central bank at the discount window **vs.** rate set by the (overnight) interbank loans market.

2012/DSE/II/13

(a) Required reserve ratio = ($500 million - $100 million) / $2 000 million (1)
= 20% (1)

(b) Maximum possible amount of deposits = $500 million × (1 / 0.2) (1)
= $2 500 million (1)

(c) Deposit = $700 million × (1 / 0.2) = $3 500 million (2)
Cash in public circulation = 0 (1)
Money supply = Deposit + Cash in public circulation = $3 500 million (1)

2013/DSE/II/12

(a) Monetary base = $400 million + $1 000 million = $1 400 million (2)
Money supply = $1 000 million + $2 000 million = $3 000 million (2)

(b) New money supply = $1 000 million + [$4 000 × (1 / 25%)] = $2 600 million (2)

2014/DSE/II/7(b)

Advantages: An increase in money supply would lower the interest rate and raise investment, leading to an increase in real output in the short run (given upward-sloping aggregate supply). Given idle resources in the economy, more labour (and/or capital) would be used to produce the bigger output, implying an increase in employment or decrease in unemployment. (Contractionary fiscal policy would not result in an increase in GDP and employment.) (2)

Disadvantages: In the long run (with vertical aggregate supply), an increase in money supply would not create any effect on output and employment. But if the fiscal deficits grow so fast that the money supply has to be increased at a higher rate that of real output, high inflation would even arise. (Contractionary fiscal policy would not result in inflation.) (2)

2014/DSE/II/12

(a) Monetary base = cash in public circulation + reserves held by commercial banks (1)
The monetary base increases because the commercial banks have more reserves. (2)

(b) Credit creation process:
When the central bank purchases bonds from commercial banks, more cash is injected to the commercial banks as reserves and there would be excess reserves in the banking system. (1)
The banks would lend out the excess reserves. (1)
And the bank loans will be re-deposited into the banking system. (1)
[The process will go on and on (until the actual reserves are equal to required reserves).]

No. The monetary base will remain unchanged as the sum of cash in public circulation and reserves in the banking system will not be affected by the credit creation process. (2)

2015/DSE/II/6

(a) (i) Legal reserve ratio = $1 000 million / $5 000 million = 0.2 (1)

(ii) Money supply = $150 million + $5 000 million = $5 150 million (2)

(b) New monetary base = $150 million + $1 050 million = $1 200 million (2)

(c) New money supply = $150 million + [$1 050 million × (1 / 0.2)] = $5 400 million (3)

2016/DSE/II/8

(a) Monetary base = $500 million + $1 000 million = $1 500 million (1)
Money supply = $500 million + $4 000 million = $4 500 million (1)

(b) Change in monetary base = $1 500 million - $1 500 million = 0 (2)

Change in money supply
= New money supply - Original money supply
= [$500 million + $1 000 million × (1 / 50%)] - $4 500 million = -$2 000 million (2)

OR

= Change in cash held by non-bank public + Change in deposits
= 0 + [$1 000 million × (1 / 50%) - $4 000 million) = -$2 000 million (2)

(c) (i) Under a fractional reserve banking system, banks are required to keep only a fraction of their deposits as reserves. They can create credit by lending out the remaining fraction in the form of loans to businesses and private individuals, which would eventually find their way back into the banking system in the form of deposits, resulting in a multiple increase in deposits / a banking multiplier larger than unity. (3)

(ii) If the legal reserve ratio is 100% (RRR = 1), the money supply will be equal to the monetary base.
OR
If all of the banks decide not to lend out their excess reserves even when RRR < 1 (e.g. during financial crisis, when default rates are high), the money supply will be equal to the monetary base. (1)

2018/DSE/II/7(a)

(i) New M_0 = $500 million + $100 million + $40 million = $640 million (2)

(ii) Banks do not hold excess reserves / there is sufficient demand for loans. (1)
There is no cash leakage. (1)

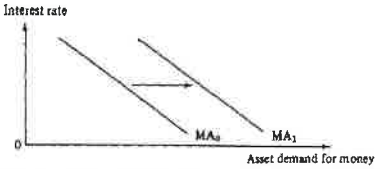
(iii) Old M_S = $2 000 million + $100 million = $2 100 million
RRR = ($500 million - $100 million) / $2 000 million = 0.2 (1)
New M_S = $100 million + [($500 million + $40 million) × (1 / 0.2)] = $2 800 million (2)
∴ M_S increases by $700 million (= $2 800 million - $2 100 million). (1)

[Credits would also be awarded to those candidates who reasoned that the public's initial cash holding of $100 million might also be deposited in to the banking system to yield $500 million of additional deposits, resulting in an aggregate increase of $1 200 million of deposits and thus a net increase of $1 100 million of money supply. As a side note, for the topic of money and banking at the DSE level, cash held by the general public should be treated as fixed (i.e., change of cash in public is assumed to be zero except under other changes).]

5.2 MONEY DEMAND

Multiple Choice Questions

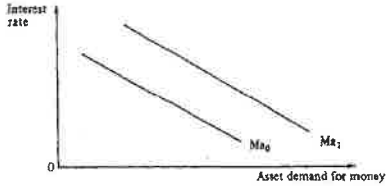
1990/AL/II/13



Which of the following correctly explains the rightward shift of the asset demand function from MA_0 to MA_1?

A. a rise in the interest rate
B. a rise in investment
C. an increase in the sale of government bonds
D. a rise in the risk of holding bonds

1991/AL/II/15



Which of the following correctly explains the shift of the asset demand for money curve from Ma_0 to Ma_1?

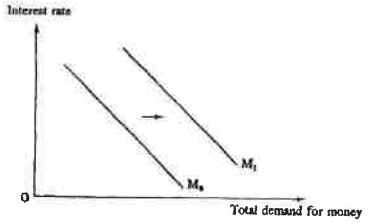
(1) a fall in the interest rate
(2) a preference for higher liquidity
(3) a widespread use of credit cards
(4) expectations of a fall in bond prices

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (4) only
D. (3) and (4) only

1993/AL/II/28
Which of the following about money demand is **NOT** true?

A. It is positively related with the anticipated inflation rate.
B. It is positively related with wealth.
C. It is negatively related with the real rate of interest.
D. It is positively related with income.

1995/AL/II/14



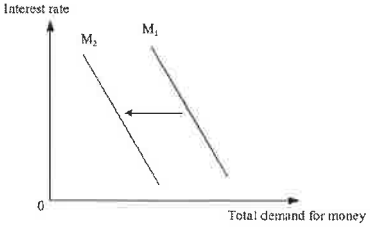
Refer to the above diagram. Which of the following correctly explains the shift of the total demand for money curve from M_0 to M_1?

A. a fall in the interest rate
B. a rise in national income
C. expectations of a rise in bond prices
D. a purchase of bonds by the government in the open market

1995/AL/II/15
If people expect a rise in the market rate of interest, they will hold _____ money for asset purposes as bond prices will _____ and they will tend to buy _____ bonds.

A. more ..... rise ..... more
B. more ..... fall ..... less
C. less ..... rise ..... more
D. less ..... fall ..... less

2001/AL/II/22



Refer to the above diagram. Which of the following can explain the shift of the total demand for money curve from M_1 to M_2?

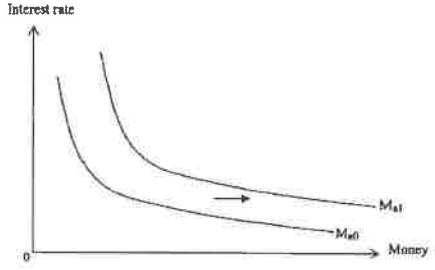
(1) a rise in the interest rate
(2) more shops accepting the Easy Pay System (EPS) payment method
(3) a fall in the national income

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2005/AL/II/15
Which of the following can explain the rightward shift of the total demand for money curve?

A. more extensive use of credit cards
B. an increase in the velocity of circulation of money
C. a fall in interest rates
D. higher risk of holding bonds

2008/AL/II/20
Refer to the following diagram.



The asset demand for money will shift from Ma_0 to Ma_1 when

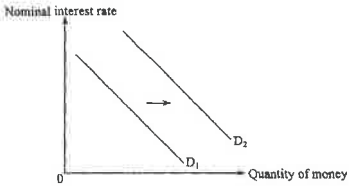
A. income increases.
B. the interest rate decreases.
C. the general price level increases.
D. the interest rate is expected to increase.

2009/AL/II/15
Which of the following statements about money demand is true?

(1) Transaction demand for money tends to be more stable than asset demand for money.
(2) The shorter the time interval between wage receipts, the higher the transaction demand for money.
(3) The higher the volatility of the financial market, the higher the asset demand for money.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

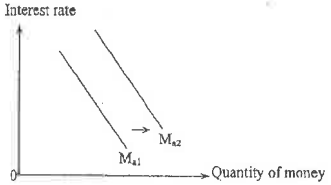
2013/DSE/I/27
Refer to the following diagram.



Which of the following will cause the money demand curve to shift from D_1 to D_2?

A. a fall in the nominal interest rate
B. a rise in national income
C. more widespread use of electronic money
D. an open market purchase of bonds by the central bank

2015/DSE/I/28
Refer to the following diagram.

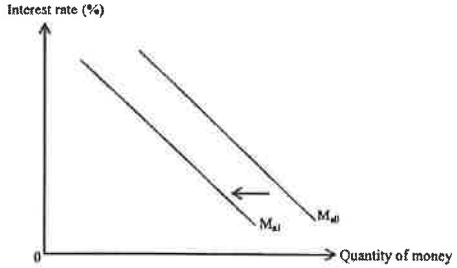


The curve of asset demand for money will shift from M_{a1} to M_{a2} when

A. the risk of investing in the stock market increases.
B. the interest rate decreases.
C. the general price level rises.
D. the government reduces the income tax rate.

2016/DSE/I/29

Refer to the following diagram.



Which of the following would lead to the above change in the asset demand for money curve?

A. The stock market becomes less volatile.
B. The general price level is expected to fall continuously.
C. The central bank raises the discount rate.
D. There is a fall in disposable income of households.

2017/DSE/I/30

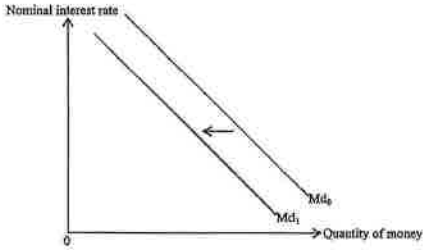
Electronic payment systems allow customers to pay without cash. ApplePay, Visa payWave and MasterCard paypass are some of the examples.

When more shops accept these electronic payment systems as a method of payment,

(1) their cost of handling coins and notes will fall.
(2) the actual banking multiplier may increase.
(3) transactions demand for money will increase.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

2018/DSE/I/29

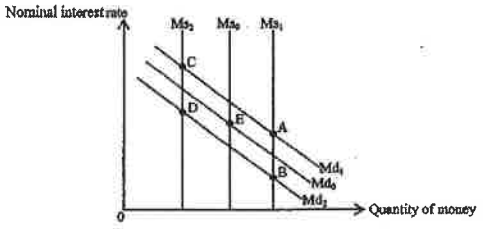


Which of the following would result in the above change in money demand?

A. The central bank issues larger denomination banknotes for circulation.
B. The expected inflation rate drops.
C. The risk of investing in stock market decreases.
D. Security problems have been found in the major electronic payment system.

2019/DSE/I/33

The diagram below shows the money supply and money demand curves of an economy. The original equilibrium point is at E.



Suppose electronic payments become more common, and the central bank increases the legal reserve ratio of the commercial banks. The new equilibrium point will be at _____.

A. A
B. B
C. C
D. D

2020/DSE/I/28

Which of the following policies would offset the effect of an increase in the willingness to invest on the price level?

(1) an increase in profits tax rate
(2) an increase in transfer payment
(3) a decrease in tax allowance

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

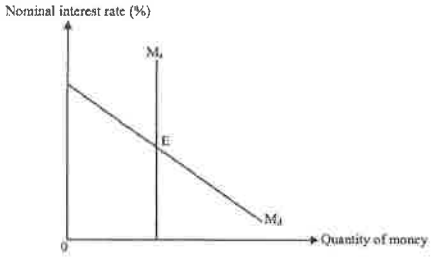
2020/DSE/I/37

An economist said, 'The continuous fall in stock prices in our country has already affected the consumption expenditure as well as the money demand. We should implement a policy to relieve the effects on the output level and the interest rate.' Which of the following policies can stabilise the output level and the interest rate in the country at the same time in the short run?
(Assume the interest rate is mainly affected by the asset demand for money in this case.)

A. The government increases cash subsidy to the poor.
B. The government gives tariff exemption to the imports of goods.
C. The central bank instructs the commercial banks to tighten the requirement of personal loans.
D. The central bank buys government bonds from the public.

2020/DSE/I/31

The following diagram indicates the money supply curve (M_s) and money demand curve (M_d) of a certain economy. Suppose the initial equilibrium point is at E.



If the income of the public increases and the central bank sells government bonds to the public, the interest rate _____ and the quantity of money _____.

A. will decrease ..... will increase
B. will increase ..... may increase or decrease
C. may increase or decrease ..... will decrease
D. will increase ..... will decrease

Short & Structured Questions

1991/AL/II/1
'The real interest rate is the opportunity cost of holding money.' Explain this statement. (10 marks)

2002/AL/II/3(a)
In microeconomics, we learn that the demand curve for any commodity shows the relationship between its price and quantity demanded. In macroeconomics, however, the demand curve for money shows the relationship between the interest rate and the quantity demanded of money.

Can we interpret the interest rate as the 'price' of holding money? Why or why not? (4 marks)

2003/AL/II/4
Money is commonly believed to be the most liquid and perhaps the safest asset on Earth.

(a) What is meant by liquidity? (2 marks)

(b) Explain why money is not necessarily a 100% risk-free asset. (4 marks)

(c) Why are people willing to hold money even though its expected rate of return is lower than that of other assets (such as bonds and stocks)? (4 marks)

2009/AL/II/2
(c) How are the real rate of interest and the nominal rate of interest related to the inflation rate? Explain clearly whether the inflation rate is expected or actual. (3 marks)

(d) Which of these two interest rates can be interpreted as the opportunity cost of holding money? Explain. (4 marks)

2020/DSE/II/9A

Ocean Park and Hong Kong Disneyland are the two large theme parks in Hong Kong.

(a) What is the market structure of the theme park industry in Hong Kong? List TWO features of this market structure. (3 marks)

2000/AL/II/16
According to the equation of exchange, if money supply is fixed, which of the following is correct?

A. Price level must be constant.
B. Both price level and real output must be constant.
C. The velocity of circulation of money will change at the same rate as real output.
D. None of the above

2000/AL/II/22
Which of the following statements concerning money supply and inflation is correct?

A. Any upward pressure on price level must be the result of an increase in money supply.
B. An increase in aggregate demand must be accompanied by an increase in money supply and inflation rate.
C. There can never be a simultaneous decrease in real output and increase in price level if the money supply does not decrease.
D. None of the above

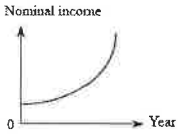
2001/AL/II/23
According to the equation of exchange, when the money supply is fixed,

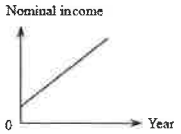
A. the growth rate of nominal income is constant.
B. the growth rate of real output is the same as the inflation rate.
C. the growth rate of nominal income is the same as the growth rate of the velocity of circulation of money.
D. the inflation rate is zero.

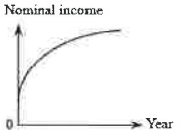
2002/AL/II/19
According to the equation of exchange, if money supply grows at the same rate as nominal income, we can conclude that

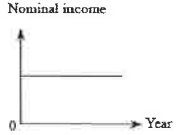
A. the price level is rising.
B. real output is constant.
C. the velocity of circulation of money is constant.
D. All of the above

2002/AL/II/23
If the velocity of circulation of money is constant and the money supply increases by a fixed amount each year, which of the following diagrams shows the value of nominal income over time?

A.


B.


C.


D.


2003/AL/II/11
According to the equation of exchange, if money supply grows during a time of deflation, it is possible that

A. the velocity of circulation of money and real output decline at the same rate.
B. the velocity of circulation of money and real output grow at the same rate.
C. the growth rate of the velocity of circulation of money is higher than that of real output.
D. the growth rate of the velocity of circulation of money is less than that of real output.

2004/AL/II/19
Consider the following data on an economy:

Year	Money Supply ($ million)	GDP ($ million, current prices)
1	45	400
2	50	600

From year 1 to year 2, which of the following statements about the economy must be correct?

A. There was a rise in real GDP.
B. There was a rise in the general price level.
C. There was a rise in the velocity of circulation of money.
D. The demand for money curve has shifted to the right.

2005/AL/II/14
The ratio of the value of transactions in an economy during a given period to the stock of money in that period measures

A. money demand.
B. the rate of growth of money supply.
C. the velocity of circulation of money.
D the money multiplier.

2005/AL/II/18
Suppose the velocity of circulation of money is held constant. According to the equation of exchange, if the growth rate of money supply is smaller than that of the real gross national product (GNP), we can conclude that

A. there is deflation.
B. the inflation rate is falling.
C. the unemployment rate is rising.
D. the growth rate of real GNP is higher than the inflation rate.

2005/AL/II/21
When the velocity of circulation of money is constant, an increase in the money supply will lead to

A. inflation.
B. deflation.
C. an increase in real output.
D. an increase in nominal output.

2007/AL/II/11
An increase in the velocity of circulation of money will

A. have no effect on real output whether or not money supply and price level are constant.
B. lead to a rise in nominal output in the absence of changes in money supply.
C. result in an increase in price level if the economy attains full employment.
D. result in decrease in money supply if price level grows at the same rate as real output.

2008/AL/II/18
Which of the following statements about the velocity of circulation of money is correct?

A. Velocity of circulation of money is measured by the ratio of nominal gross domestic product (GDP) to nominal money stock.
B. The growth rate of velocity of money can be positive in some years and negative in others.
C. The growth rate of velocity of circulation of money is assumed to be zero in the classical quantity theory of money.
D. All of the above

2009/AL/II/22
Consider the following data of an economy.

	Year 1	Year 2
Money supply ($)	40 million	48 million
Velocity of circulation of money	5	5.5
Real output (unit of goods)	20 million	24 million

According to the equation of exchange, what is the inflation rate of Year 2?

A. 8%
B. 9.1%
C. 10%
D. 11%

2011/AL/II/24
If the real output is decreasing at a faster rate than the velocity of circulation of money,

A. money supply will be increasing at a rate slower than that of the price level.
B. money supply will be decreasing at a rate slower than that of the price level.
C. money supply will increase when there is inflation.
D. there will be deflation when money supply remains unchanged.

2012/AL/II/16
If an economy attains full employment, an increase in money supply will increase _____.

A. the nominal interest rate
B. the real interest rate
C. the level of nominal output.
D. the level of real output

2012/AL/II/20
Which of the following statements about the equation of exchange is correct?

A. It predicts that money is neutral.
B. It still holds even if there is a change in institutional factors.
C. It predicts that a 1% increase in money supply leads to a 1% increase in the price level.
D. It assumes that the technological level is constant.

2013/DSE/I/32
The real output of an economy grows at a lower rate than the money supply. According to the quantity theory of money, we can conclude that

(1) the price level is increasing.
(2) the unemployment rate is decreasing.
(3) the velocity of circulation of money is decreasing.
(4) the nominal output is increasing.

A. (1) and (2) only
B. (1) and (4) only
C. (2) and (3) only
D. (3) and (4) only

2014/DSE/I/37
Suppose the velocity of circulation of money remains constant. If a central bank reduces money supply by 10%,

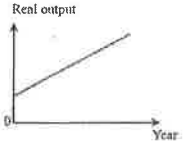
A. the price level will decrease by 10%.
B. real output will decrease by 10%.
C. nominal output may decrease by less than 10%.
D. real output may decrease by less than 10%.

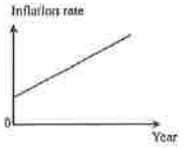
2015/DSE/I/33
The quantity theory of money implies that

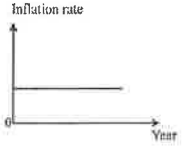
A. an increase in money supply will lead to a rise in price level when real output is falling.
B. the economy is always at the full employment output level.
C. an increase in money supply will lead to a decrease in the velocity of circulation of money when real output is kept constant.
D. an increase in money supply will lead to a same-proportional increase in real output.

2016/DSE/I/34
According to the classical quantity theory of money, which of the following diagrams is correct when money supply is growing at a constant percentage each year?

A.


B.


C.


D.


MARKING SCHEME

1990/AL/II/14 C	1995/AL/II/18 D	2000/AL/II/22 D	2005/AL/II/21 D (77%)	2014/DSE/I/37 D (56%)
1990/AL/II/26 C	1996/AL/II/14 A	2001/AL/II/23 C	2007/AL/II/11 B (77%)	2015/DSE/I/33 A (58%)
1991/AL/II/14 A	1996/AL/II/20 C	2002/AL/II/19 C (52%)	2008/AL/II/18 D (61%)	2016/DSE/I/34 D (34%)
1991/AL/II/16 A	1997/AL/II/12 B	2002/AL/II/23 B (73%)	2009/AL/II/22 C (71%)	2017/DSE/I/36 C (64%)
1992/AL/II/20 B	1997/AL/II/22 D	2003/AL/II/11 D	2011/AL/II/24 A (59%)	2018/DSE/I/37 B (72%)
1994/AL/II/17 D	1998/AL/II/14 C	2004/AL/II/19 C (44%)	2012/AL/II/16 C (69%)	2019/DSE/I/35 A
1994/AL/II/22 D	1999/AL/II/14 D	2005/AL/II/14 C (74%)	2012/AL/II/20 B (48%)	2021/DSE/I/38 A
1994/AL/II/24 B	2000/AL/II/16 D	2005/AL/II/18 A (56%)	2013/DSE/I/32 B (74%)	

Note: Figures in brackets indicate the percentages of candidates choosing the correct answers.

1990/AL/II/8(a)(ii)
It all depends.
If the growth rate of the money supply approximately equals the growth rate of real output, then the inflationary consequence will be minimal.
However, if the growth rate of the money supply exceeds the growth rate of real output, inflation will occur.

1991/AL/II/2
Explain MV = PY as an identity in accounting. It is only when V and Y are constant that a change in M gives rise to an equi-proportional change in P, the money price level. (M / P) is always a constant --- prediction of the classical QTM.

The classical QTM is used in conjunction with the classical theory, which states that (in the long run) flexible relative prices imply full employment. Y in this context refers to full employment output. The classical QTM requires the (long run) assumption of full employment rather than explaining full employment.

1993/AL/II/4
According to the Quantity Theory of Money, PY = MV
where P = price level, Y = output, M = money supply and V = velocity.

Assume V is constant. If the percentage change in income is 5% and the percentage change in the money supply is 10%, the inflation rate is (i.e. P increases by) 5% (= 10% - 5%).
(We cannot predict the rate of inflation if V is not constant.)

1999/AL/II/4
(a) Inflation is related to monetary factors in the sense that, other things being equal, prices must rise as money supply is increased because we then have more money to spend on the same quantity of goods. [This can also be explained in terms of the quantity theory, assuming constant velocity and output.]

(b) The quantity equation implies that the inflation rate is equal to the negative of the output growth rate when money supply and velocity are constant. In other words, prices can also rise when we use the same quantity of money to chase after a smaller quantity of goods.

2000/AL/II/8
(a) Using the equation of exchange, we have MV = PY. If velocity is constant, nominal income (PY) must grow at the same rate as the money supply. As both Y and P can change, we cannot separate the impact on P and Y. If we know how Y grows, we can predict the impact of M on P.

(b) (i) Given velocity is constant, nominal income grows at the same rate as the money supply.
Nominal income growth rate in year 2 = (110 - 100) / 100 = 10%
Nominal income growth rate in year 3 = (121 - 110) / 100 = 10%

(ii) Inflation rate in year 2 = 10%
Inflation rate in year 3 = 10% - 3% = 7%

(c) If the velocity of circulation is constant and real income grows at a constant known rate, then setting the growth of money supply at a specific rate can achieve the target rate of inflation.

2002/AL/II/2(a)
True.
QTM: $g_P = g_M + g_V - g_Y$
$g_P > 0$ even when $g_M = 0$ as long as $g_V > g_Y$ (such as when velocity is constant and output is declining).

2007/AL/II/3(b)
The velocity of circulation of money is the number of times an average dollar changes hands – as a medium of exchange to facilitate market transactions – within a certain time period.

Using the Equation of Exchange, we can measure the velocity by the ratio of nominal GDP to money supply.

2010/AL/II/2(c)
MV represents the total amount of circulating money in the economy within a given period of time. Py or GDP represents the total money value of (final) goods and services produced in the economy within the same period. MV = Py because, in a monetary economy, money changes hands whenever buyers use the money they hold (supplied by the central bank) to purchase goods and services from the sellers.

The Equation of Exchange implied that:

$$g_P = g_M + g_V - g_y,$$

which implies in turn 2 possible sources of inflation (Quantity Theory of Money as a theory of inflation):

- growth in the money supply --- i.e., $g_M > 0$, given $g_V = g_y = 0$ (or given $g_M > g_y$ and $g_V = 0$); and
- output decline --- i.e., $g_y < 0$, given $g_M = g_V = 0$.

2012/DSE/II/13(d)
QTM: MV = PY, where M = money stock, V = velocity of circulation of money, P = general price level and Y = real output, assuming V constant. (2)

An increase in M leads to an increase in P when Y increases by a smaller proportion.
OR
An increase in M leads to an increase in P by the same percentage when Y is constant. (2)

2018/DSE/II/7(b)
MV = PY, where M: money supply, V: velocity of circulation of money, P: price level, and Y: output (2)

Assume V and Yare both constant. Then when M increases, P would increase by the same proportion.
OR
Assume V is constant. Then when the percentage increase in M is higher than that in Y, P would increase as well. (2)

2020/DSE/II/4C

C) M= Nominal Money Supply
V = Velocity of Money
P = General price level.
Y = Real National Income
While both V and Y are assumed to be constant in the long run. Percentage change of Money supply equal to the percentage change of price level. Continuously expansionary monetary policy (increase of M) will lead to persistent increase of general price level (increase of P) (4 marks)