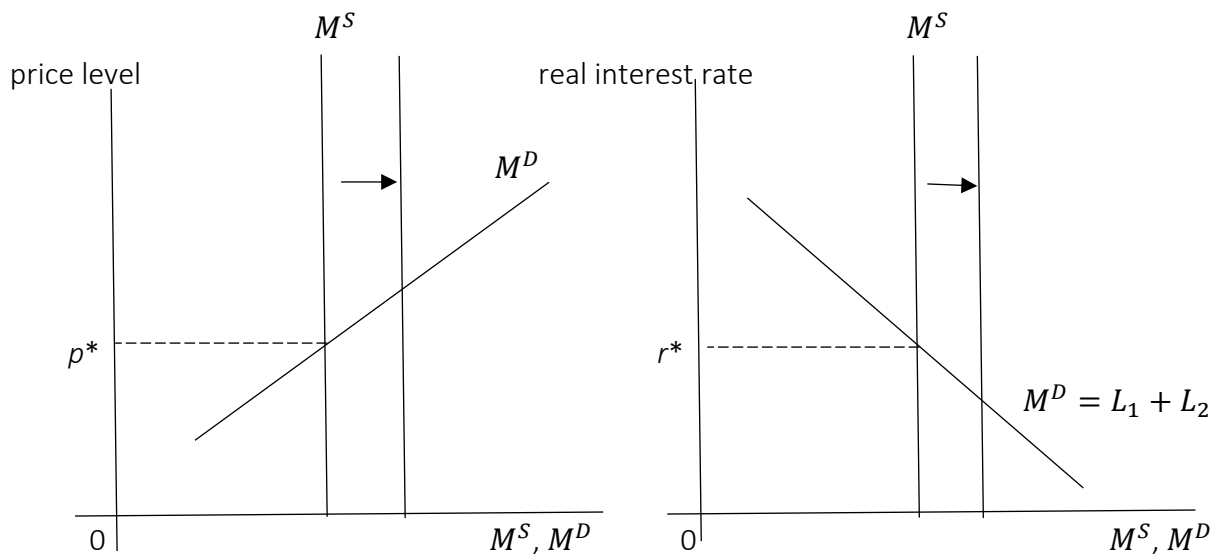# Week Seven

EPA143A

EXOGENOUS MONEY versus ENDOGENOUS MONEY

S. STORM & C.W.M. NAASTEPAD

ANSWERS

EXERCISE **W-7.1**

1. If the central bank increases money supply, the graphs will change as follows:

In the neoclassical money market (left panel), higher money supply will generate inflation: the general price level increases. Real GDP is at its full employment level and coefficient *v* is constant. More money relative to unchanged real GDP must raise *p*. This shows that central banks can influence inflation by adequately controlling money supply (in this model).

In the IS-LM model, the LM-curve (not shown) will shift to the right as money supply increases. The economy will grow, because banks reduce the interest rate (in response to the excess supply of money). Money demand will adjust to money supply.

2. The balance sheet will change as follows:

<div align="center">ROBA Bank – June 2, 2020</div>

assets = 'active'   liabilities = 'passive'

cash reserves = €100 + 2.5 m	deposits = €1000 + 25 m
loans = €1200 + 22.5 m	inter − bank loans = €200 m
govt. bonds = €200 m	equity = €300 m
total = €1500 + 25 m	total = €1500 + 25 m

How much deposit money will the commercial banking system create? The cash-reserve ratio = 0.1. This means that banks can create (1/0.1) = 10 x 25 = €250 million deposit money.

How large is the money multiplier in this case? $\left(\frac{1}{\rho}\right) = \frac{1}{0.1} = 10$.

3. **Conclusion (a):** it can be seen from the graph that commercial banks hold bigger cash reserves than what is required. This means that these banks are not fully loaned-up.

Conclusion (b): it can be seen from the graph that the actual cash reserve ratio fluctuates considerably; this means that actual ρ is not stable and hence the money multiplier $\left(\frac{1}{\rho}\right)$ is not stable.

Conclusion (c): if the money multiplier is unknown (because the actual reserve ratio varies and is unpredictable), central banks cannot directly control money supply.

EXERCISE **W-7.2**

1. The balance sheet will change as follows:

Koschmerz Bank – June 2, 2020

assets = 'active'   liabilities = 'passive'

cash reserves = €100 m	deposits = €1000 + 10 m
loans = €1200 + 10 m	inter − bank loans = €200 m
govt. bonds = €200 m	equity = €300 m
total = €1500 + 10 m	total = €1500 + 10 m

Koschmerz Bank will first write a loan contract for Mr. Toorich; loans (on the asset side) will increase by €10 million. Secondly, Koschmerz Bank will open a new deposit account for Mr. Toorich; deposits (on the liability side) rise by €10 million. Total assets and liabilities increase by €10 million. Koschmerz Bank now has insufficient cash reserves (it lacks €1 million of cash).

2. Koschmerz Bank has to acquire €1 million extra cash. It can sell bonds worth €1 million in exchange for cash. Or it can obtain an inter-bank loan of €1 million.

3. If Koschmerz Bank has to write off €150 million of loans, the balance sheet will change as follows:

Koschmerz Bank – June 2, 2020

assets = 'active'   liabilities = 'passive'

cash reserves = €100 m	deposits = €1000 m
loans = €1200 − 150 m	inter − bank loans = €200 m
govt. bonds = €200 m	equity = €300 − 150 m
total = €1500 − 150m	total = €1500 − 150 m

Assets decrease by €150 million; hence, liabilities must decrease as well. Because deposit-holders and other banks are protected, the damage is for the shareholders; equity declines by €150 million. The solvency of the bank decreases, because the

difference between assets and (deposits + inter-bank loans) has become less. If Koschmerz Bank incurs more losses on its loans, equity may be driven down to zero.

4. The solvency problem may turn into a liquidity problem if the deposit-holders of this bank become concerned about 'their wealth' (deposited in this bank). Once deposit-holders begin to withdraw money, cash reserves of Koschmerz Bank will decline – and the bank will have to obtain extra cash. How? By selling bonds, by borrowing from other banks? If the crisis turns into a run on this bank, Koschmerz Bank will face both a liquidity crunch and a solvency crisis.

5. The central bank is called the lender-of-last-resort, because commercial banks (when facing a liquidity crisis) can always borrow cash from the central bank – even when other banks are not willing to lend and other sources of obtaining cash have dried up. To prevent a larger banking-sector crisis, the central bank will normally come to the rescue of commercial banks facing a liquidity crunch.

6. It is possible for commercial banks to grow and make more profits by increasing their lending operations. The problem is that with each new loan, there comes a risk of default – and the more loans a bank originates, the higher the bank's risk exposure becomes. A bank will initially lend to creditworthy borrowers, but if it wants to expand, it may lend to less (sub-prime) borrowers as well. This way, the risk profile of the bank increases. Credit-rating agencies (and central banks) monitor banks' lending activities and asses the risks involved. These agencies will downgrade the credit-rating of a bank if they observe increases in risk exposure (in the loans issued by this bank). If a bank is down-graded, it will face higher borrowing costs itself; other banks will become less willing to lend and only at higher interest rates. The higher borrowing costs reduce bank profits.

7. The key implications for macro-economic theory are:
   1. Investment is – indeed – autonomous, as it can be pre-financed by bank credit (= new money), without the prior availability of savings (deposited as loanable funds in banks). The neoclassical loanable-funds market does not exist.
   2. Central banks cannot directly control money supply (using the cash-reserve ratio and reserves) and use it as an instrument of monetary policy. Instead, central banks use the interest rate as their policy instrument through which they try to affect real GDP and inflation.