4.4 Money and banking

Name: _____ Class: _____ Date: _____ **Total: 15 marks**

KEY WORDS money multiplier • reserve ratio

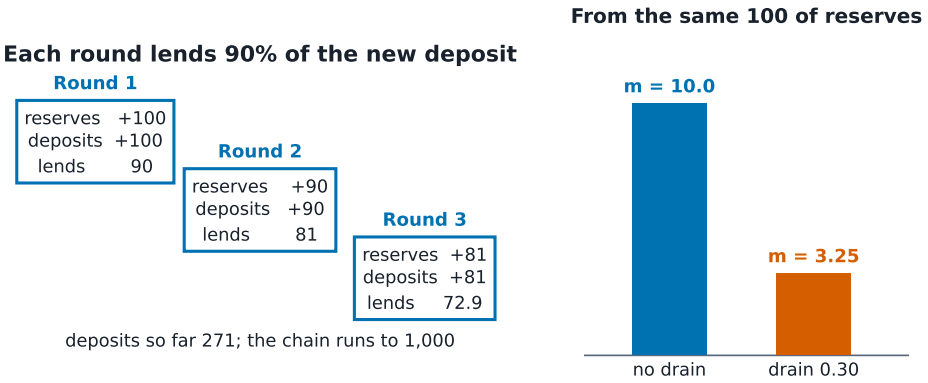
Objective

Trace deposit creation through bank balance sheets; compute multipliers with and without a cash drain; price the tools' interlocking; convert nominal to real at the policy desk.

1 Key knowledge and worked examples

■ The chain and the leak

Each round lends $1 - r_d$ of the new deposit; the limit is $1/r_d$ of the reserve injection. With a cash drain c: $m = (1 + c)/(r_d + c)$. The central bank's four tools interlock – a quantity change is a rate decision in other units.



Each round lends 90% of the new deposit; the currency leak shortens the chain

■ Worked example. Aurora's system

100 of reserves at $r_d = 0.1$: rounds 100/90/81 … → 1,000 of deposits ✓. With $c = 0.3$: $m = 1.3/0.4 = 3.25 \rightarrow 325$ ✓. A 10 open-market sale drains 32.5 of money ✓.

2 Practice

2.1 The reserve ratio is 8%. Compute the multiplier with no cash drain, and the deposits created by a 200 reserve injection. [2]

2.2 Cash drain is now 0.2. Compute the multiplier and the deposits supported by the same 200 of reserves. [3]

2.3 With $m = 4.29$ (two decimals), what open-market SALE drains 150 of money? [2]

2.4 The policy rate is 7% and expected inflation is 5%. The ex-ante real rate (two decimals)? What is it if the rate rises to 9%? [3]

2.5 In two lines: why does the multiplier's arithmetic limit overstate what banks actually do? [2]

2.6 True or false with one line each: (a) a bank lends its reserves to borrowers; (b) a credit card limit is money; (c) the lending facility exists for orderly times. [3]

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Solutions

2.1

- Multiplier $= 1/0.08 =$ **12.5**.
- Deposits $= 200 \times 12.5 =$ **2,500**.

2.2

- $m = (1 + 0.2)/(0.08 + 0.2) = 1.2/0.28$.
- $=$ **4.29**.
- Deposits $= 200 \times 4.29 =$ **857** (857.1).

2.3

- Sale $= 150/4.29$.
- $=$ **35** (34.97) – tools interlock: a small reserve operation moves broad money in multiples.

2.4

- $1.07/1.05 - 1 =$ **1.90**%.
- At 9%: $1.09/1.05 - 1 =$ **3.81**%.
- The real cost of borrowing doubled from a 2-point nominal move – transmission is arithmetic before it is psychology.

2.5

- Banks lend when profitable, creditworthy borrowers exist – the multiplier is a ceiling, not an engine.
- And loan demand, regulation and confidence all shorten the chain the formula assumes runs to completion.

2.6

- (a) False – lending creates a deposit; reserves settle payments between banks.
- (b) False – credit pays LATER with money; the limit itself is not money.
- (c) False – it exists for panics, at a penalty price.

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