

# The Payment Machine

Do we really share a common view of  
how the money system works?

12th Annual AMI Monetary Reform Conference

Chicago, 29 Sep – 2 Oct 2016

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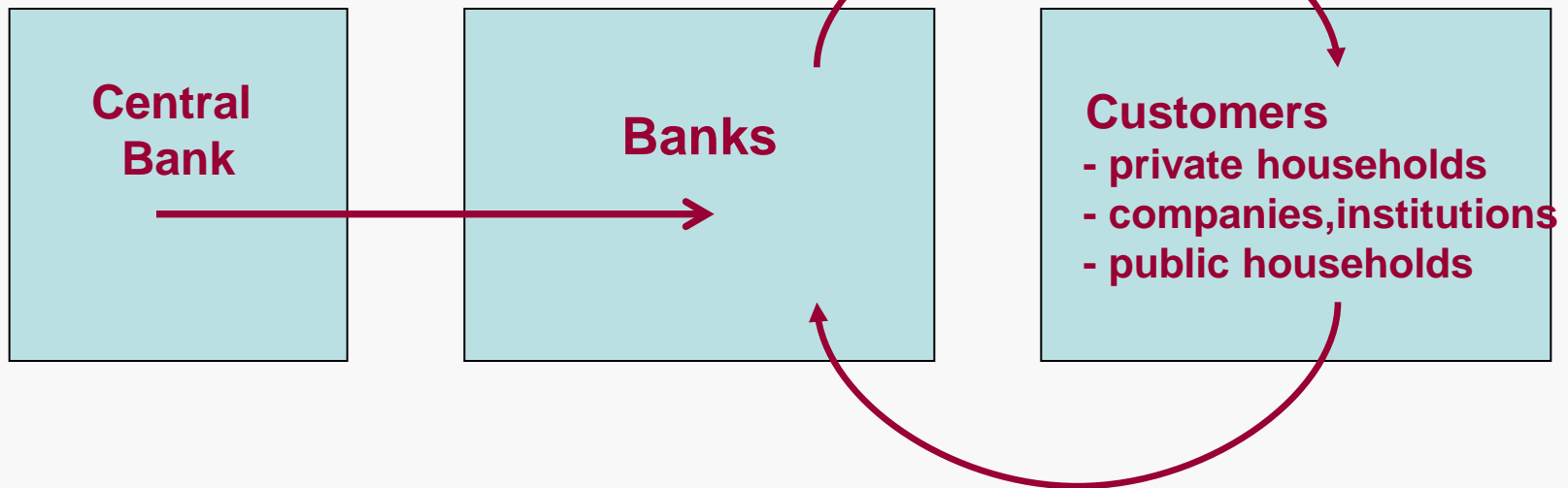
Martin Luther University  
Halle Wittenberg



# The two-tier banking structure

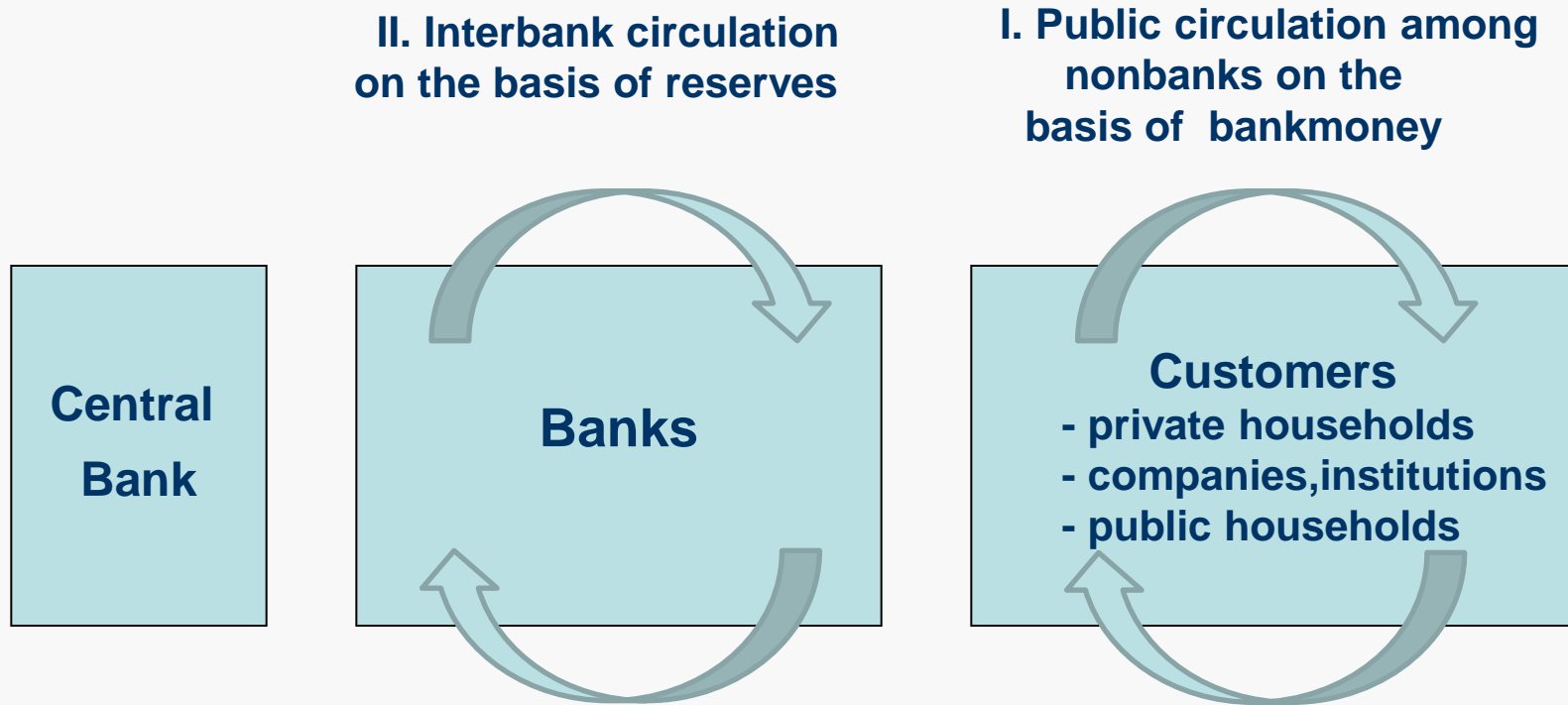
Cash (banknotes + coins)  
and reserves

Deposit creation  
by repeated loan making



Money or credit multiplier:  
repeated on-lending of deposits

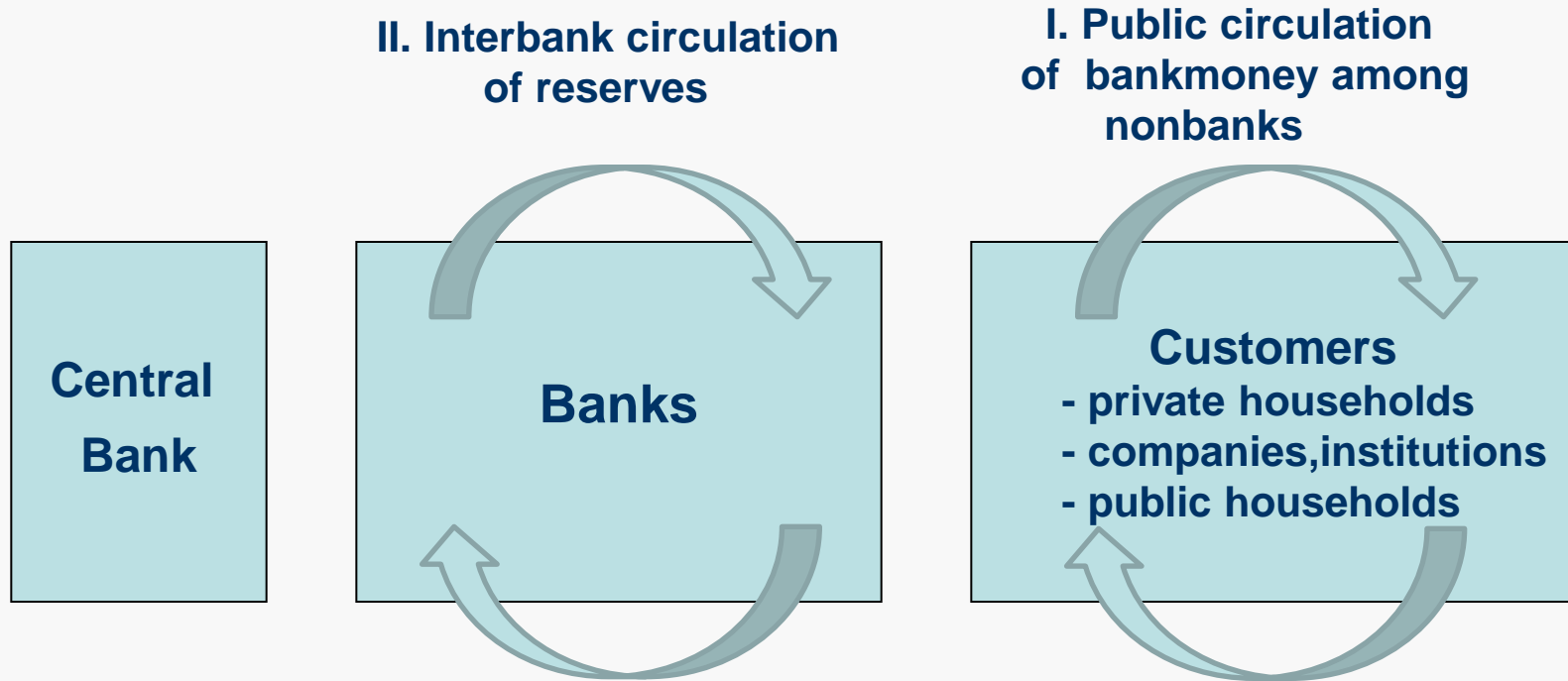
# 1. The split circuit of reserve banking



**Bankmoney** = Credits on customers' current bank account, available any time on demand (thus: demand deposits or sight deposits), serving for cashless payments in electronic payment systems.

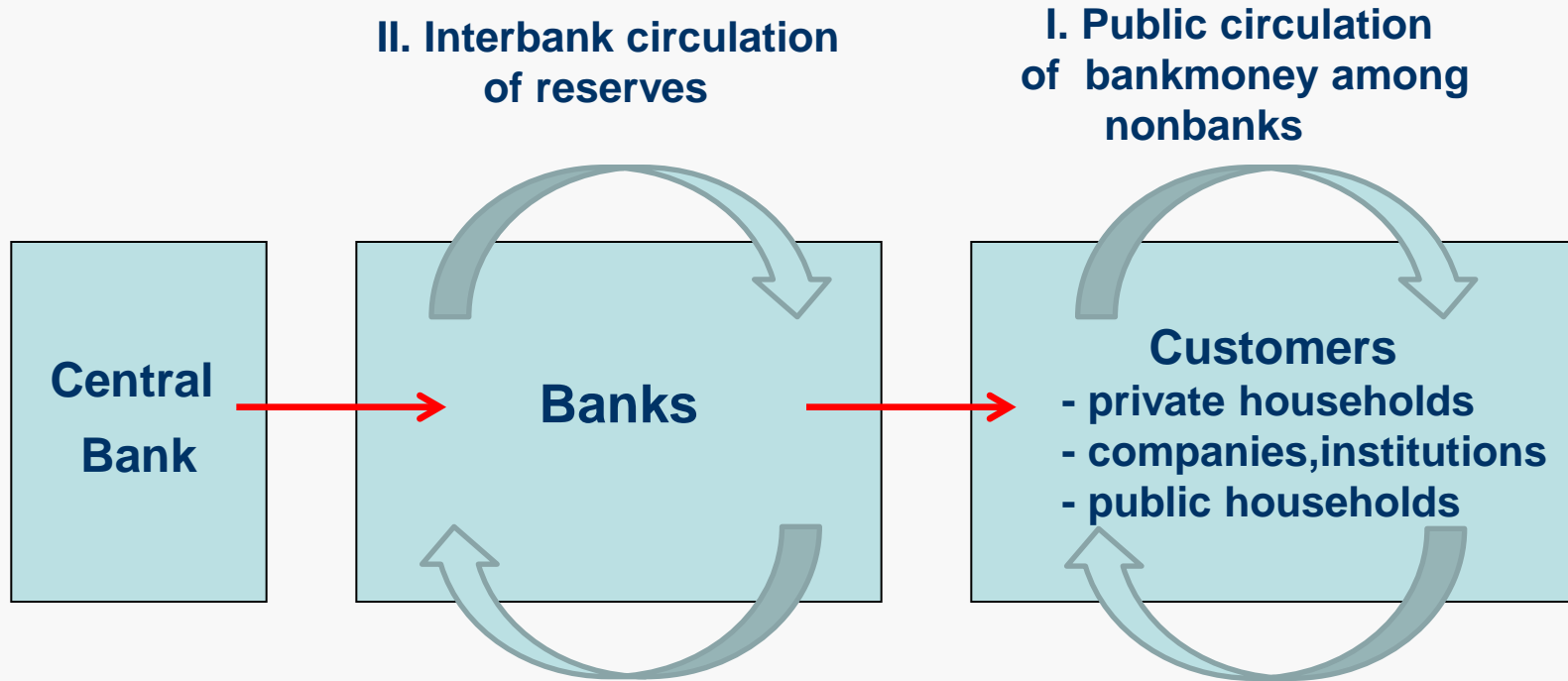
**Reserves** = Credits on banks' central-bank accounts = Central-bank money.

## 2. Modern money is non-cash

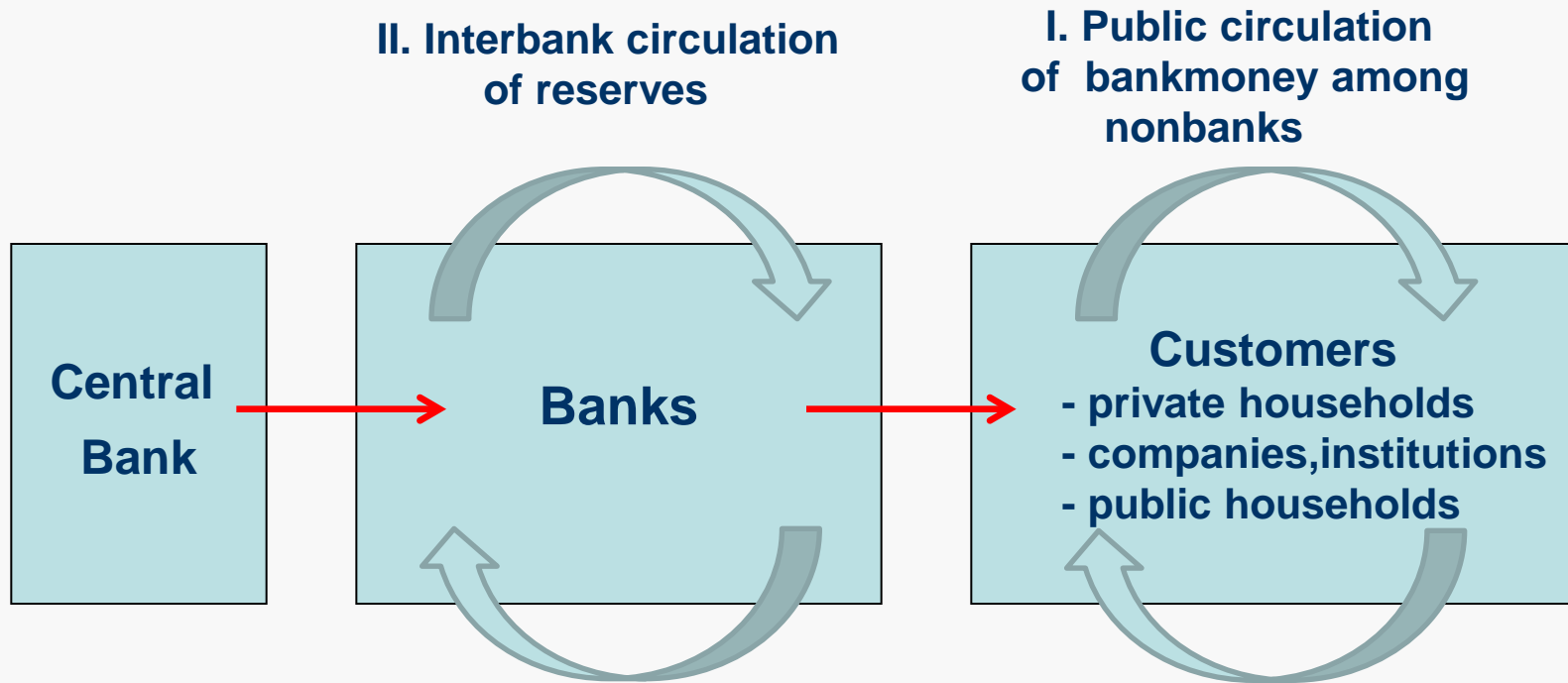


At source, modern money is non-cash. Traditional solid cash (coins, notes) is but a residual technical subset of the bankmoney in circulation, exchanged out of or back into a bank account. Cash is no longer constitutive for the money system.

# 3. Uno-actu identity of money and credit



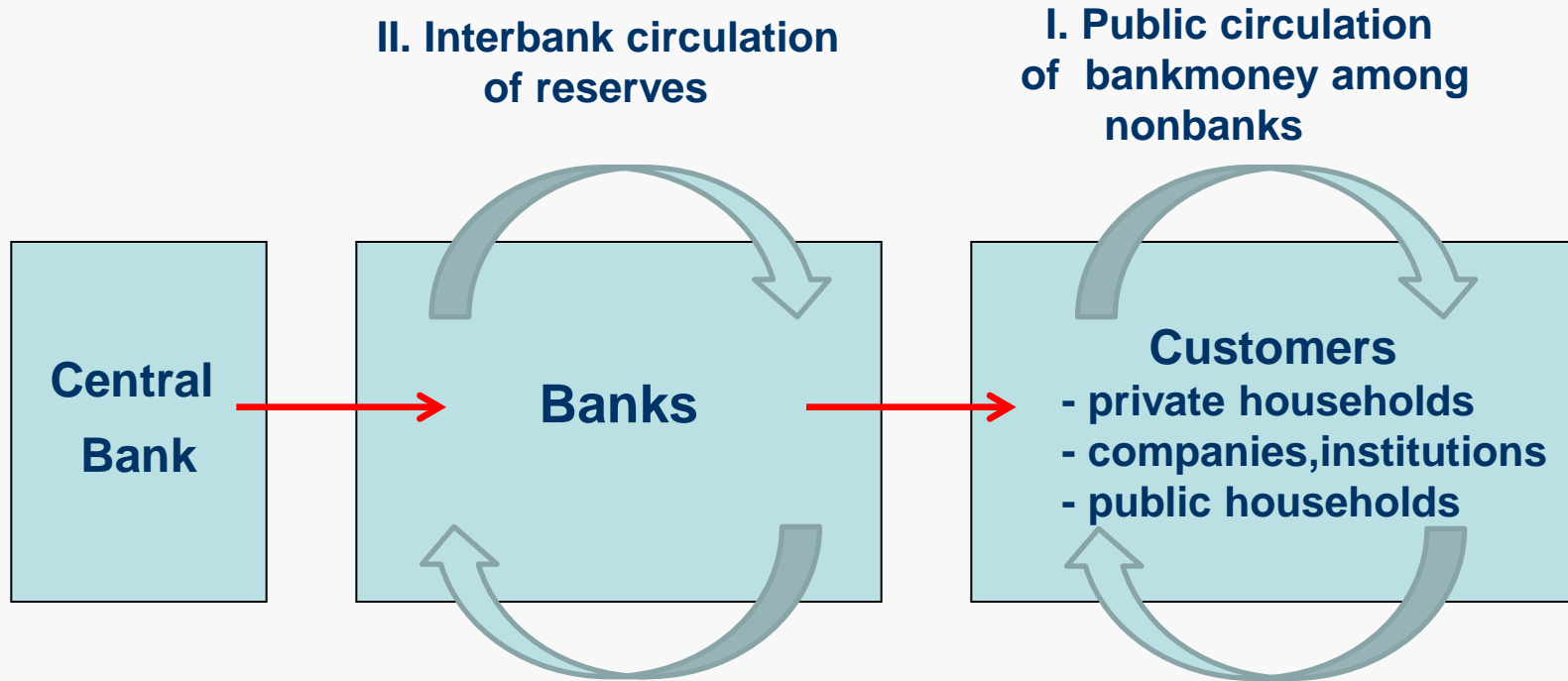
# 3. Uno-actu identity of money and credit



Banks create credit (= bankmoney) whenever they

- make loans and grant overdrafts to nonbanks
- purchase assets such as bonds, stocks, real estate, ... from nonbks
- spend money on anything else (even if the latter charges a bank's equity).

### 3. Uno-actu creation of money and credit



Bankmoney created in either way is but a promissory ledger entry  
→ **a claim of the customer on the bank** to have that bankmoney transferred on demand or paid out in cash  
→ **a liability of the bank toward the customer** to pay (transfer or cash out) on demand of the customer.

# Credit extension and bankmoney creation in one act

Bank Balance Sheet		Customer	
Assets	Liabilities	Debit	Credit
100 k, mio	100	- 100	+ 100
Claim on customer from credit creation	Liability towards customer	Interest-bearing debt to the bank	Credit as liquid bankmoney (means of payment) = claim on cash and bankmoney transfer

Accounting record:

Bank Lending/Securities/Tangibles Account to Customer Current Account

In actual fact, however, this does not make sense – not yet, because you borrow in order to make use of the money, and using bankmoney involves central-bank money, i.e. cash and reserves.



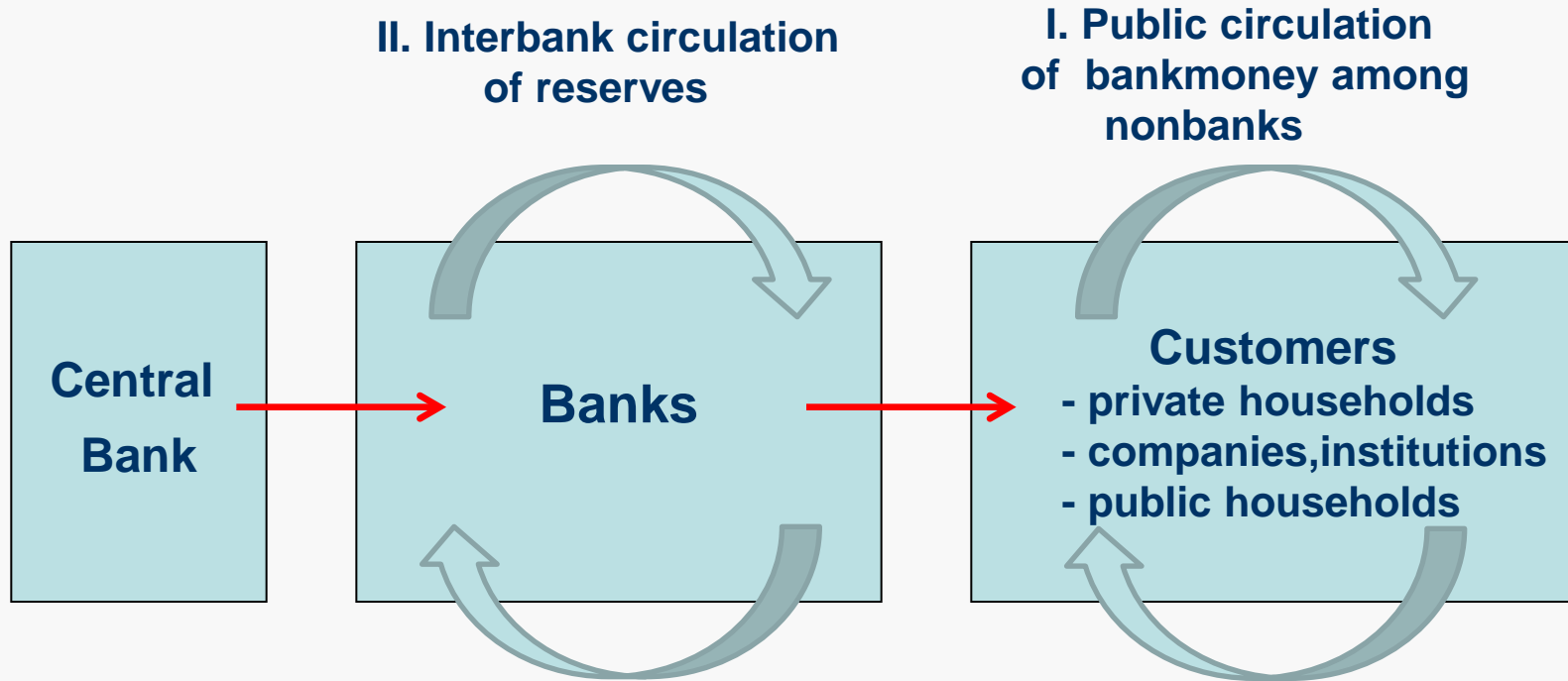
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The much-quoted balance-sheet expansion does not occur in one individual bank. Bankmoney transfer reduces a balance sheet. Rather, it is about an act of co-operative bankmoney creation of the entire banking sector.

The credit claim adds to the balance sheet of bank X, the bankmoney liability adds to the balance sheets of bank Y that receives payments among customers.

## 4. Credit Creation and Credit Transfer



Credit is a word of dual use, meaning

(a) making a loan, lending money

(b) crediting/debiting some account

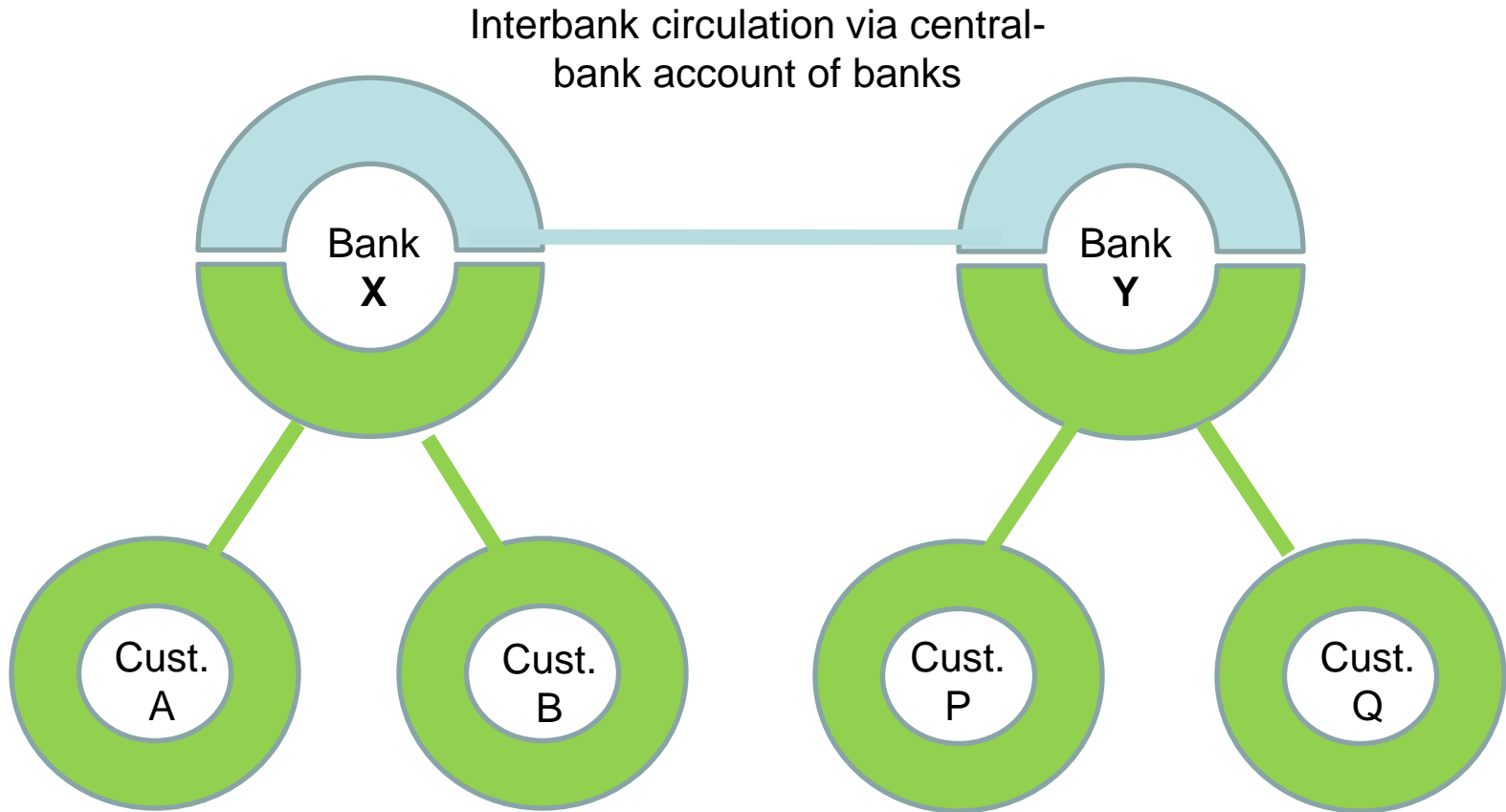
The red arrows symbolise credit creation = money creation, adding to M

The thicker circular ones signify credit transfer = money circulation, not adding to M

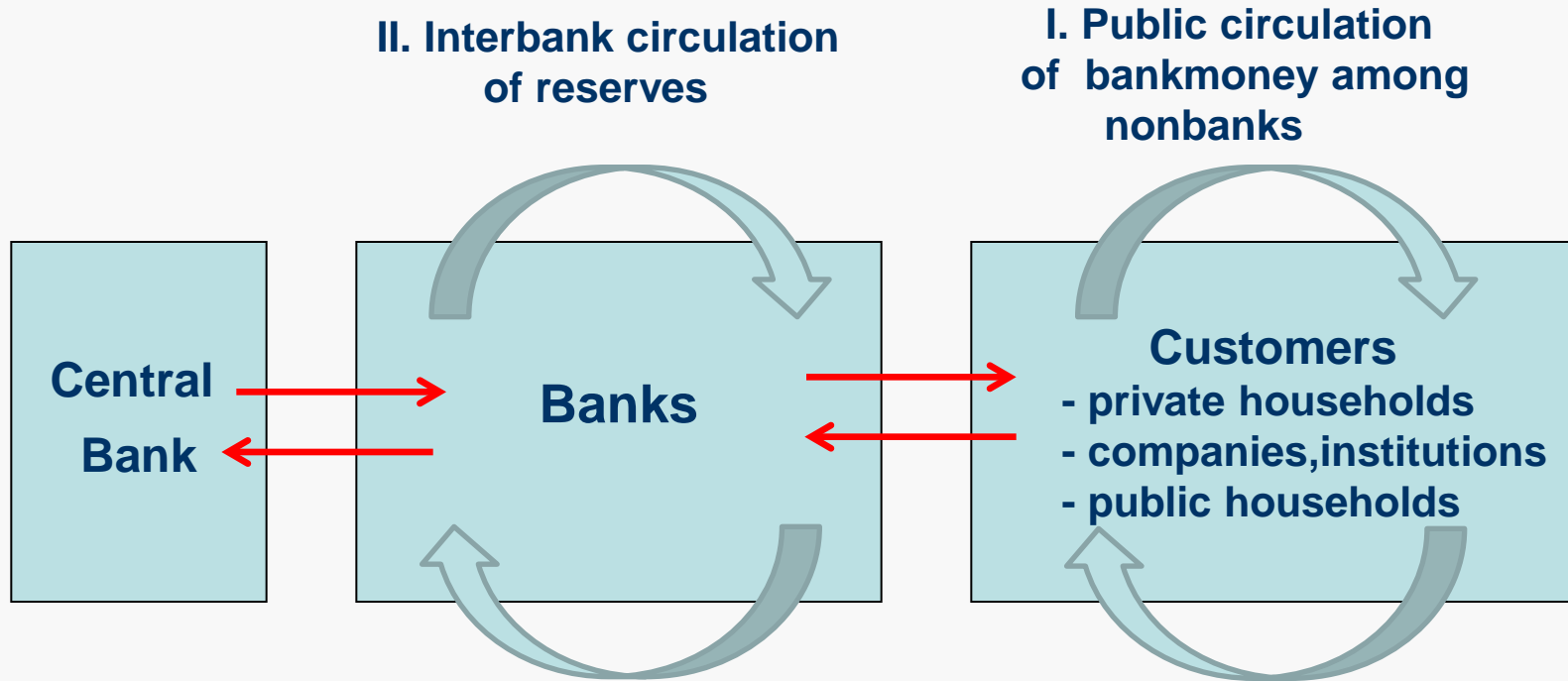
# 4. Bankmoney transfer via reserve transfer

Central bank money (reserves in interbank circulation)

Bankmoney (deposits in public circulation)

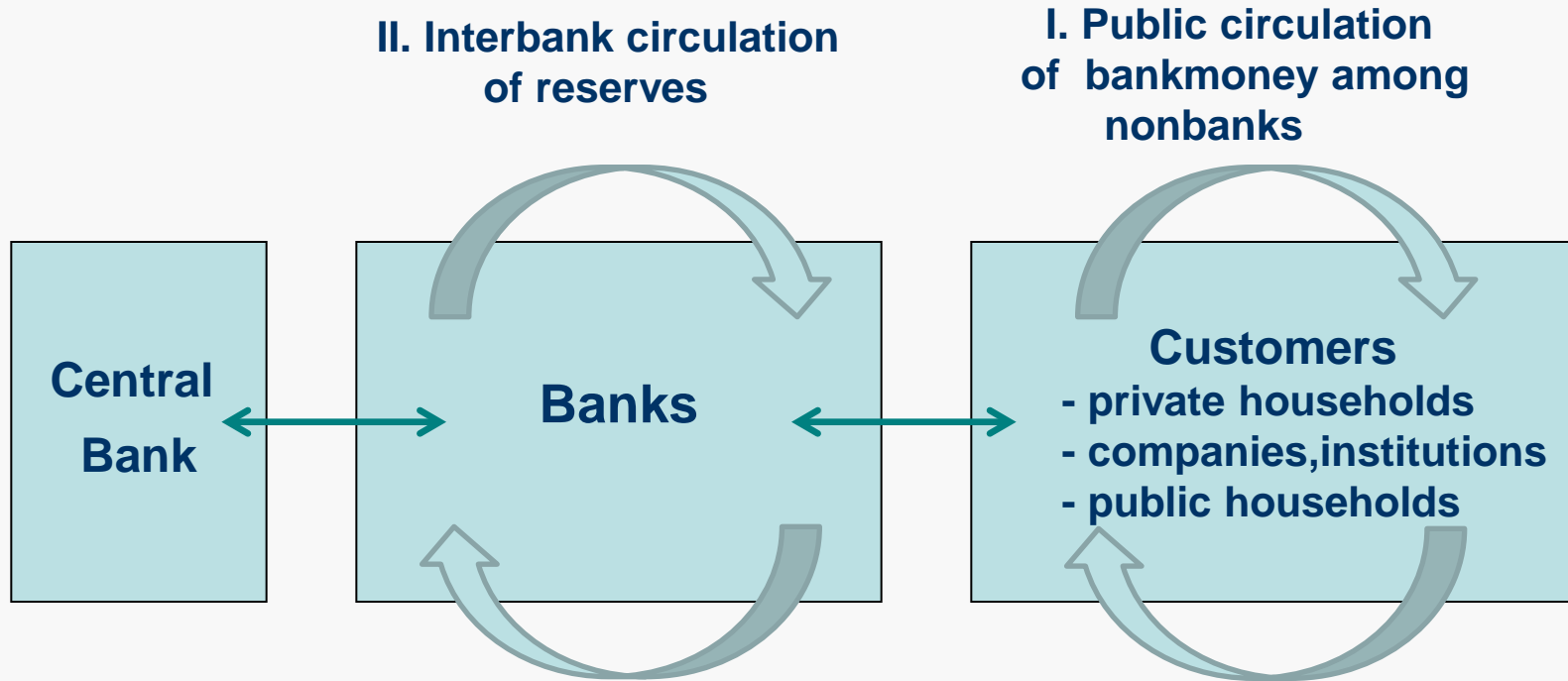


# 5. Deletion bankmoney and reserves



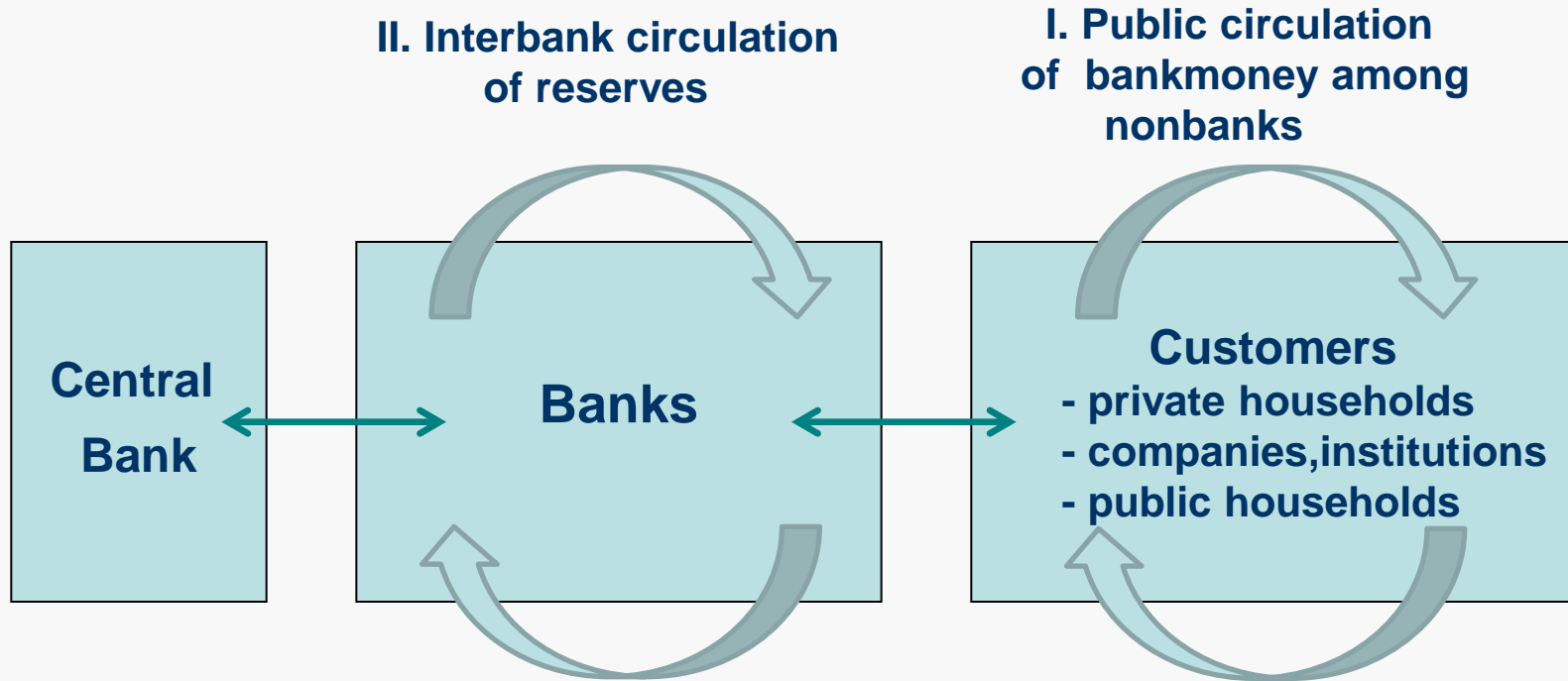
Any payment from bank to nonbank creates bankmoney.  
Any payment from nonbank to bank deletes bankmoney.  
Equally, any payment from cbk to bank creates reserves.  
Any payment from bank to cbk deletes reserves.

## 6. The system is bank-led



The initiative of money creation is with the banks. Central banks re-finance the banks, re-actively, upon or after the fact. Cbks always accomodate the facts the banks have created beforehand. By their pro-active lead in primary credit creation (bankmoney creation), banks determine the entire money supply, including the accomodating creation of reserves and cash by the central banks.

# 7. Fractional reserve banking



The amount of reserves in interbank circulation is only a fraction of the amount of bankmoney in public circulation. How can this be?

## 7. Fractional Reserve Banking

In order to create and maintain 100 units of demand deposits, the banking sector needs fractional 'coverage' in central-bank money of about 8–10% in the US

- 1% cash (coin and banknotes) for the ATMs
- 0.1–0.5% liquid reserves (excess res.) for settlement of payments
- 10% obligatory minimum reserve, minus cash in vault and further items (of no real use, except for central-bank profit)

about 2.5–3% in the euro area

- 1.4% cash (coin and banknotes) for the ATMs
- 0.1–0.5% liquid reserves (excess res.) for settlement of payments
- 1 obligatory minimum reserve (of no real use, except...)

How can this be if all interbank payments involve the same amount of money as the bankmoney transfers carried out?

# Operating principles of fractional reserve banking

- Outflows = Inflows
- Distributed transactions
- Non-segregation of client money
- Co-operative bankmoney creation



# Operating principles of fractional reserve banking

- **Outflows = Inflows**

Outgoing reserve payments of a bank are incoming reserves in other banks, and vice versa.

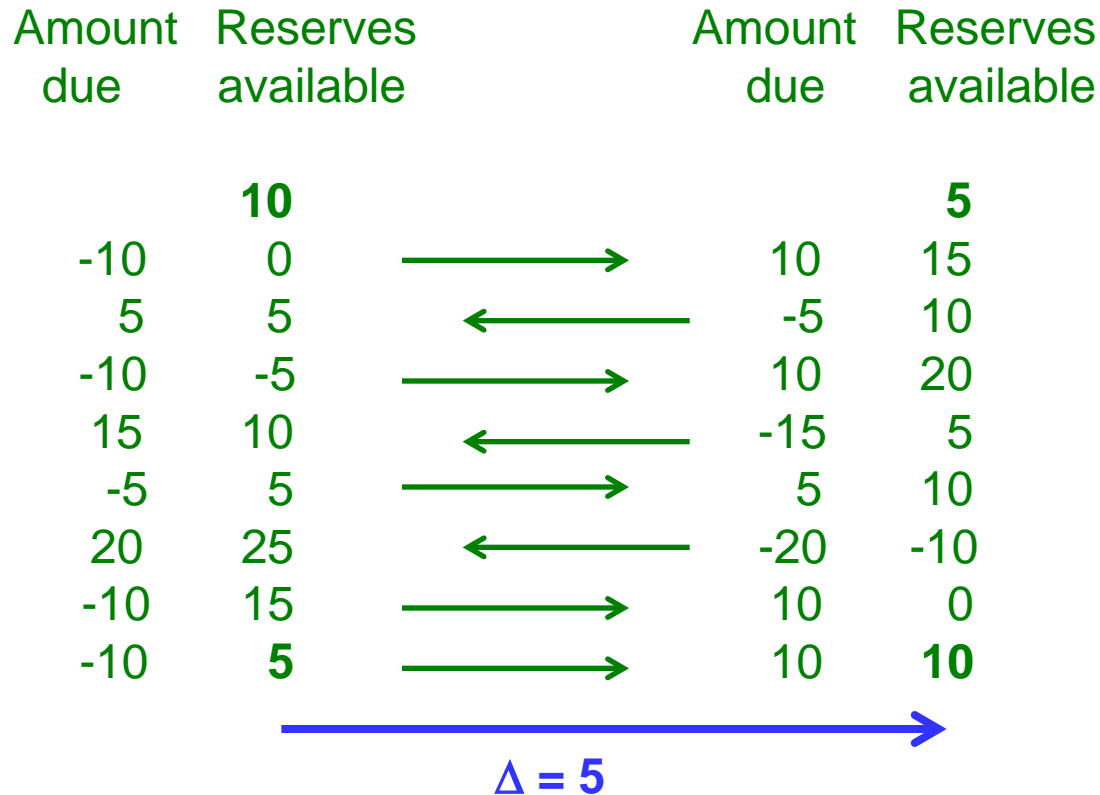
- **Distributed transactions**

i.e. payments are spread over time and actors and do not include all of the bankmoney at once, with outgoing and incoming payments largely offsetting each other.

**Put differently, the velocity of reserve circulation in the interbank circuit is much higher than is the case with bankmoney in public circulation.**

→ see figure

Distributed transactions, non-segregation, and proceeding in step allow large payment volumes on a small base of reserves and cash



<b>Payments made</b>	<b>-45</b>	<b>-40</b>
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<b>Entire turnover</b>	<b>85</b>	
<b>Reserves</b>	$\Sigma$	<b>15</b>

# Operating principles of fractional reserve banking

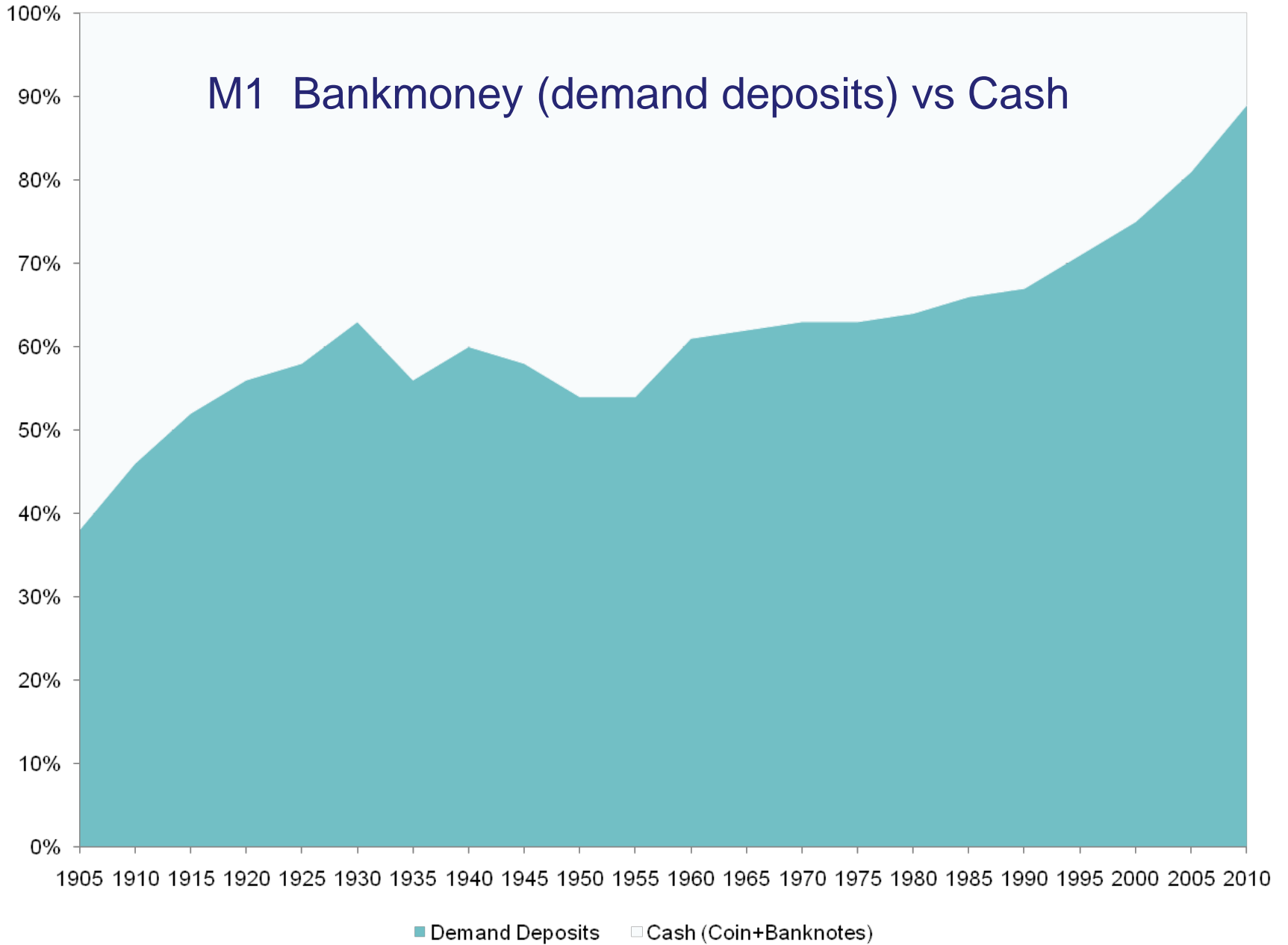
- **Non-segregation of client money**

No requirement to keep own money and client money in separate accounts. All outgoing and incoming payments of a bank are processed via one and the same operational central-bank account of a bank.

- **Co-operative bankmoney creation**

Pace and rate of credit extension and bankmoney creation must be largely in step, and the banks must accept each other's transfer of deposits (bankmoney).

# M1 Bankmoney (demand deposits) vs Cash



■ Demand Deposits    □ Cash (Coin+Banknotes)  
Data: Swiss National Bank, Historical Time Series, No.1, Feb 2007, 1.3, 2.3

# The present money system

## Private bankmoney regime

- based on reserve banking backed by the central bank
- warranted by the government

State-backed rule of private bankmoney

# Fallacious models of money and banking

- **Piggy bank model**

1. 'Deposits are created by depositing cash'
2. 'My money is in the bank'

- **Loanable funds model of banking**

'My bank is working with my money' (either demand or sav. or time)  
→ T - account

- **Financial intermediation theory of banking**

1. 'A bank intermediates between savers and borrowers'.
2. 'A bank passes reserves on to customers'.

As a consequence for macroeconomics,

- regarding **primary bank credit: 'investment ≠ savings'**

However,

- with regard to **secondary credit**, that is, on-lending of bankmoney among nonbanks, '**investment = savings**' still holds true.

# Assets and liabilities in a bank's balance sheet

## Assets

- Cash in vault
- Reserves - excess  
- minimum
- Overdraft outstanding
- Loans outstanding
- Securities
- Real estate
- Other
- Other

## Liabilities

- Debt with cbks and banks
- **Demand deposits**  
= overnight liab. to customers  
= **active** bankmoney
- **Savings and time deposits**  
= temporarily **deactivated**  
bankmoney
- Other
- Equity - paid-up capital  
- balance of Prof&Loss  
- balance of Earn&Exp

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## R. Werner's typology of banking models

- (1) Financial intermediation theory of banking based on the loanable funds model of deposits (deposit intermediation between depositors and borrowers)
- (2) Reserve circulation theory, i.e. doctrine of pre-set reserve positions and multiplier model (treating cash, reserves and bankmoney as interchangeable within a same class of money)
- (3) Bank credit creation – banks creating bankmoney out of nothing.

Richard Werner 2014: Can banks individually create money out of nothing? The theories and the empirical evidence, *International Review of Financial Analysis* 36 (2014) 1–19.

## Stone age circulation



Rai (stone money) of the Isle of Yap, Caroline Islands, Southern Pacific. Rather huge, one weighs several tons, much too heavy to carry around.

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