



# European Macroeconomics

An aerial view of a city skyline, likely Zurich, featuring several prominent skyscrapers. The sky is overcast with grey clouds. A dark blue horizontal band is overlaid across the middle of the image, containing the main title. Below this band, a grey horizontal band contains the subtitle. The bottom portion of the image shows a dense urban area with various buildings, including a church with a green dome.

# 3. The financial system and banks in the two models

## Lecture 3

A large, 3D-style sign with the words "ON AIR" in white, bold, sans-serif capital letters. The sign is set against a reddish-pink background and has a dark grey shadow, giving it a floating appearance.

# ON AIR

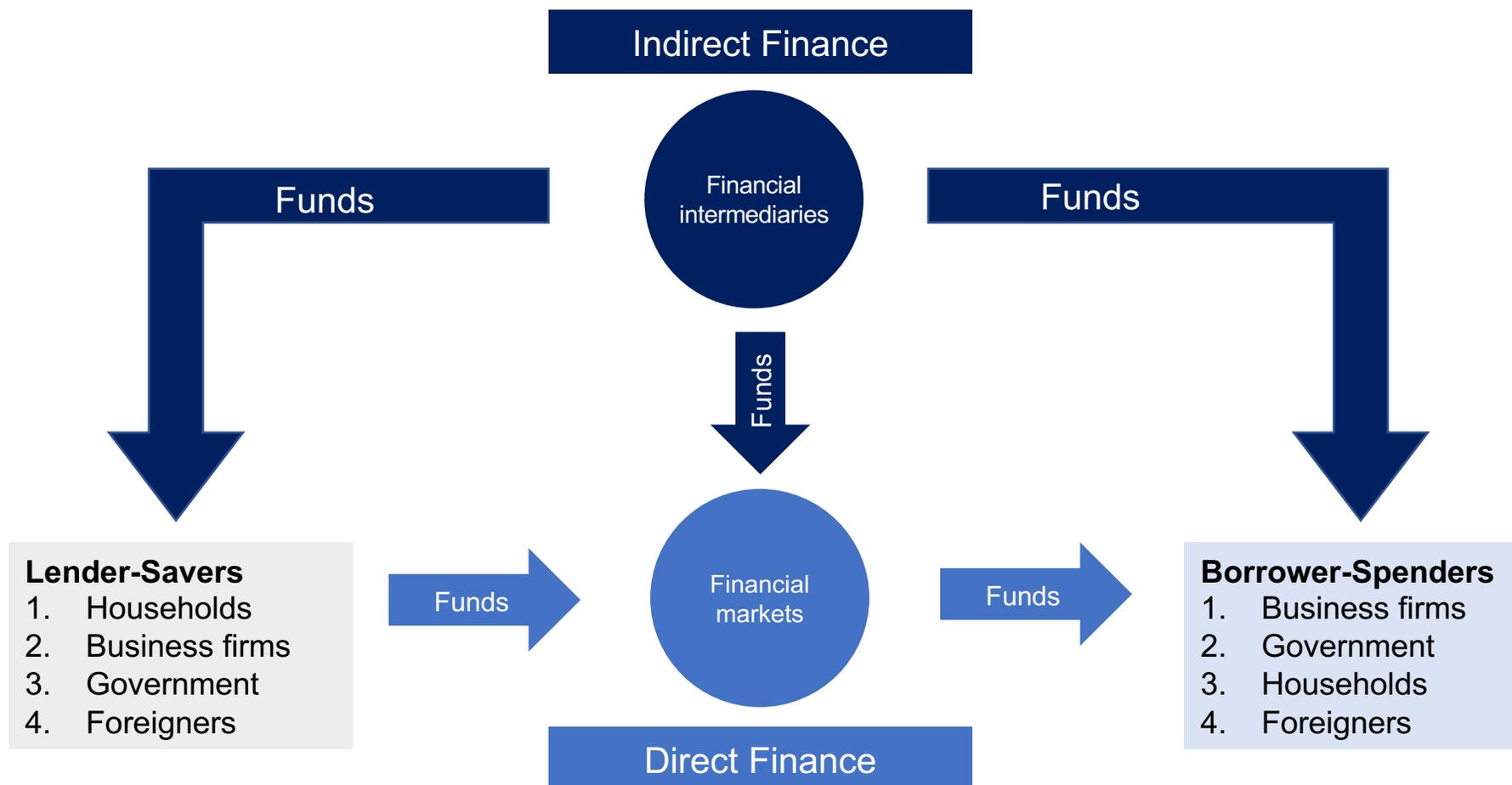
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If you take part in the lecture by using video or audio you agree to this.

A man in a dark shirt and overalls is shown from the chest up, leaning forward and examining a stalk of wheat in a field. The background is a vast field of wheat under a warm, golden light, suggesting sunset or sunrise. The overall mood is one of agricultural care and natural beauty.

# **(1) The classical model**

# The flow of funds from savers to borrowers in standard textbooks



Source: own representation following Mishkin

# The flow of funds from savers to borrowers in standard textbooks



## Explanation:

- The typical textbook presentation of the financial system of the 21st century is based on the classical model.
- Funds are created by household who decide to save
- Banks and the capital market are mere intermediaries for funds. Banks are not fundamentally different from other intermediaries („capital market”)
- The funds are consumed by investors where the flow of funds comes to an end

# The role of banks in the classical model

## Acemoglu et al. (2016)

„Banks are only one of many types of financial intermediaries (...).“

„Many different types of financial institutions act as financial intermediaries channeling funds from suppliers of financial capital – in other words, savers – to users of financial capital.“

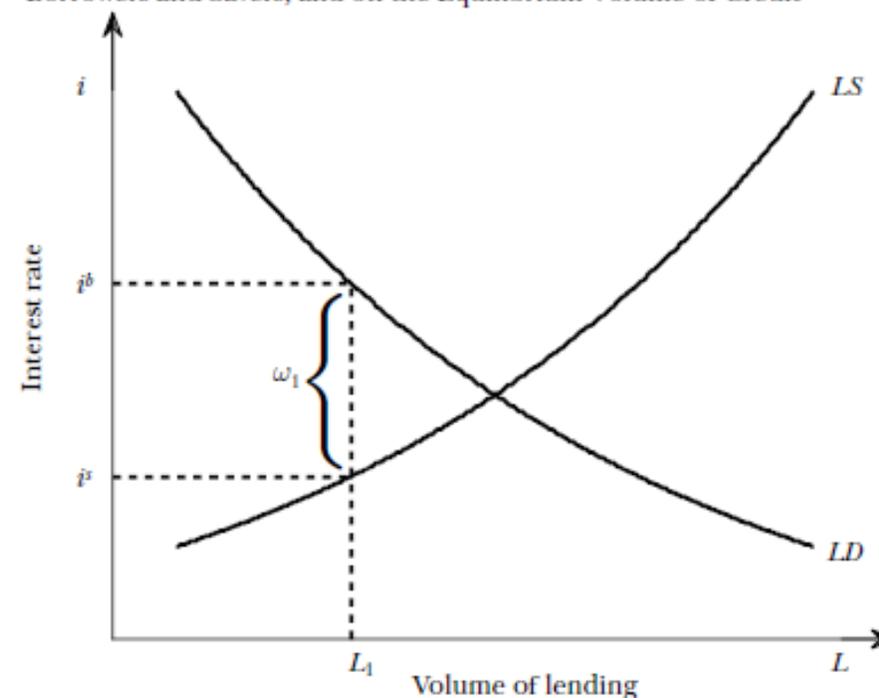


# Banks as a friction between savers and borrowers

- In the classical model, banks are mere **conduit** for the flow of funds from savers to borrowers
- Compared to a situation, where savers can lend directly to investors, bank intermediation requires resources. In the chart from Woodford (2010), they are represented by a „**Credit Spread**“
- The interest rate which the investors ( $i^b$ ) have to pay is higher than the interest rate savers ( $i^s$ ) receive
- Therefore, banks are treated as a (credit supply) friction

## Credit Market Equilibrium with Credit Supply Frictions

A: Effect of a Credit Spread  $\omega_1$  on the Equilibrium Interest Rates for Borrowers and Savers, and on the Equilibrium Volume of Credit



Source: Woodford (2010),

URL: <https://www.aeaweb.org/articles?id=10.1257/jep.24.4.21>

# The role of money in the classical model

Robert Barro, *Macroeconomics*, p. 127:

- „We assume there is a **single type of good** which can be used for consumption or investment
- The goods market is the place in which households exchange goods for money
- The **price** in this market, denoted  $P$ , expresses the **numbers of dollars that exchange for one unit of goods**
- We call  **$P$  the price level.**“

→ **Open Questions:**

- If there is only one good, **why do we need money?**
  - As a means of payment, money helps to avoid the **double coincidence** of wants („the hungry tailor waiting for the baker that needs a new pair of trousers“)
  - With only the APG, **money is useless**. Nobody would exchange the APG for money.
- If there is only one good, what is the **role of a price** and the **price level?**
  - In the APG world, only **intertemporal** trade is possible. Thus, a price of the APG for **intra-temporal** trade is as useless. The concept of a price level also makes no sense.
- How does the money come into circulation?

# „Helicopter money“ is the way how money comes into circulation in the classical model

- “Let us suppose now that one day a helicopter flies over this community and drops an additional \$1,000 in bills from the sky, which is, of course, hastily collected by members of the community.
- Let us suppose further that everyone is convinced that this is a unique event which will never be repeated.
- (...) suppose further that each individual happens to pick up an amount of money equal to the amount held before.
- (...) the final equilibrium must be a nominal income of \$20,000 instead of \$10,000, with precisely the same flow of real services as before.”

Source: Milton Friedman, 1969, p.4



# The role of the central bank in the classical model

- As the central bank cannot produce the APG it has no influence on the real interest rate and it cannot influence saving and investment
- The classical model assumes that the central bank can control the money stock (cash).
- The key equation in the classical model is the Quantity Equation:

$$MV = PY$$

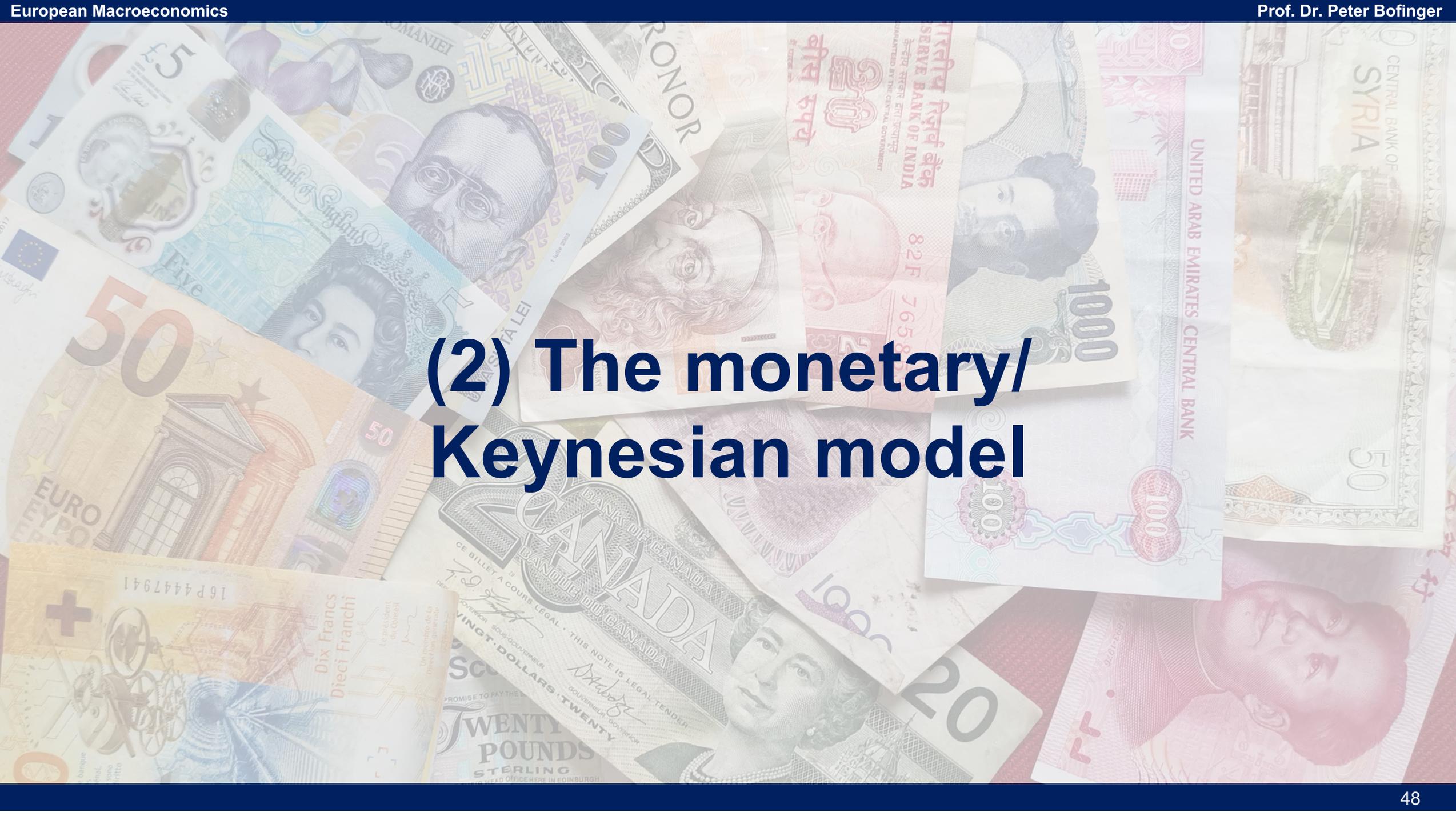
- It assumes that there is a relationship between the money stock (M), the velocity of money (V) on the one side and the price level (P) and real output (Y) on the other side
- Assuming a constant velocity of money and a constant real output, there is a proportional relationship between the money stock and the price level.



Source: <https://personal.lse.ac.uk/reisr/bio.html>

*“Either way, the central bank is not all that different from the parking tickets’ office, or the issuer of permits for boats: it collects a revenue and uses it to provide direkt fiscal transfers that lower the fiscal burden of the government.”*

– Reis, R. (2019), *The Oxford Handbook of the Economics of Central Banking*, p. 144



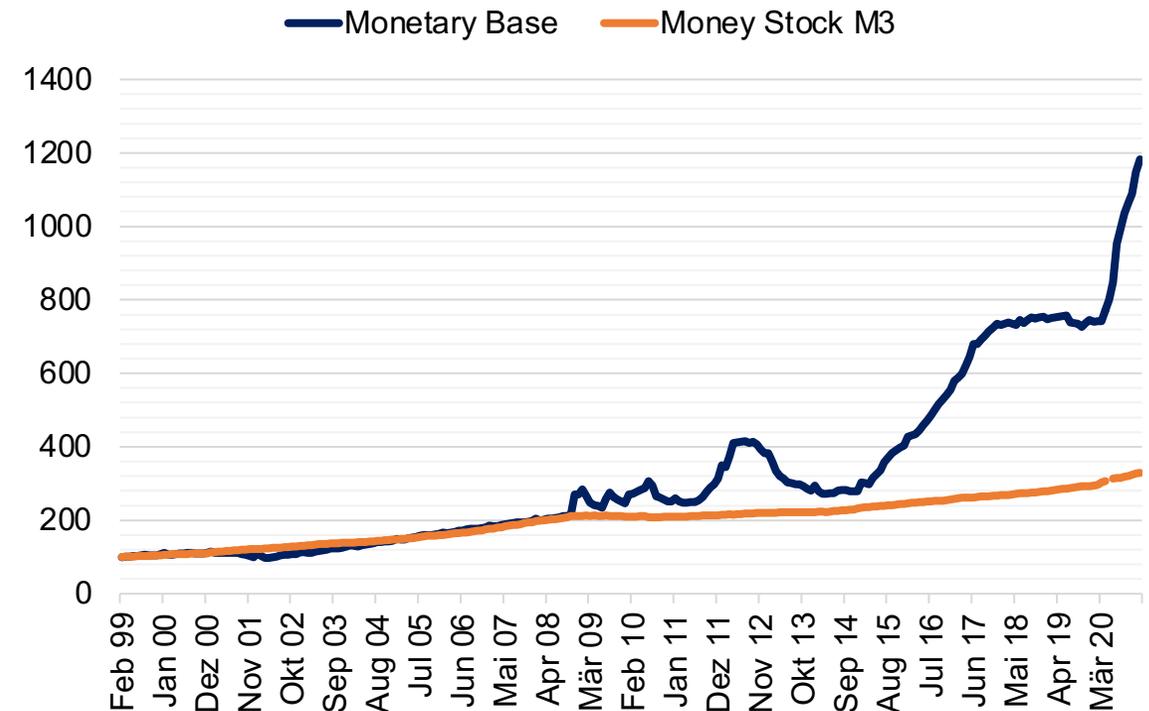
# (2) The monetary/ Keynesian model

# „Funds“ are money - and not the APG

- What is „money“?
- **Money stock M1:** Liquid deposits („sight deposits“) held by households, firms and the government with commercial banks
- Do not confuse M1 with the **monetary base:** Deposits held by banks with the central bank (reserves) and cash
- „Finance“ means the temporary provision of liquid bank deposits
  - by banks providing loans
  - by private households or firms buying corporate bonds or government bonds on the capital market

## Euro Area: Monetary Base and Money Stock M3

(February 1999=100)



# Where does the money come from?

- Banks do not need deposits from savers for giving a loan
- Bank create deposits by giving a loan
- The supply of (demand for) money is identical with the supply of bank loans



## A simple example:

- Mr. Smith needs 1,000 euros to buy a laptop. He obtains the money by asking his bank for credit. His demand for money corresponds to the demand for credit.
- The bank grants the credit and credits the amount to his account.  
The bank's offer of credit corresponds to the bank's offer of money

# Deposits do not create loans, loans create deposits

Balance sheets after the bank gave the loan to Mr. Smith

Mr. Smith		A-Bank	
Demand deposit with A-Bank	Loan by A-Bank	Loan to Mr. Smith	Demand deposit Mr. Smith
1,000 Euro	1,000 Euro	1,000 Euro	1,000
(= Money stock M1)			

- We can see that the **mechanics** of the Keynesian/monetary model are just the opposite of the mechanics of the classical model
- In the classical model, banks need deposits to give loans. **Deposit generate loans**
- In the Keynesian model, banks create deposits by giving loans. Loans **generate** deposits
- In this model, banks can in principle create loans **ex nihilo** which is the main cause for **financial crises**

# Implications of its lending for A-Bank

## How can Mr. Smith use the deposits he has obtained with the loan?

- a) Making a payment to an account with the B-Bank
- b) Cash withdrawal for a payment in cash
- c) Making a payment to another account of A-Bank

## What does this imply for A-Bank?

- a) Interbank payments are settled via the central bank: The central bank deposits (“reserves”) of A-Bank decline, the central bank deposits of B-Bank increase
- b) A-Bank must order cash from the central bank. Its central bank deposits decline
- c) A-Bank must hold higher minimum reserves with the central bank

## 1) Initial situation

(assumption: minimum reserve requirement is covered by deposits at central bank)

Mr. Smith		A-Bank		Central bank (CB)		B-Bank		Mr. Miller	
		Reserves at central bank	Refinancing loan CB	Refinancing loan to A-bank and B-bank	Reserves A-Bank	Reserves at central bank	Refinancing loan CB		
		5,000	5,000	10,000	5,000	5,000	5,000		
					Reserves B-Bank				
					5,000				

## 2) A-Bank grants 1,000 euro loan to Mr. Smith

Mr. Smith		A-Bank		Central bank (CB)		B-Bank		Mr. Miller	
Deposit at A-Bank	Loan by A-Bank	Reserves at central bank	Refinancing loan CB	Refinancing loan to A-bank and B-bank	Reserves A-Bank	Reserves at central bank	Refinancing loan CB		
1,000	1,000	5,000	5,000	10,000	5,000	5,000	5,000		
		Loan to Mr. Smith	Deposit by Mr. Smith		Reserves B-Bank				
		1,000	1,000		5,000				

### 3) Mr. Smith transfers 1,000 euro to Mr. Millers account at B-Bank

Mr. Smith		A-Bank		Central bank (CB)		B-Bank		Mr. Miller					
Loan by A-Bank	1,000	Reserves at central bank	4,000	Refinancing loan CB	5,000	Reserves A-Bank	4,000	Reserves at central bank	6,000	Refinancing loan CB	5,000	Deposit at B-Bank	1,000
		Loan to Mr. Smith	1,000			Reserves B-Bank	6,000	Refinancing loan CB	5,000	Deposit by Mr. Miller	1,000		
				Refinancing loan to A-bank and B-bank	10,000								

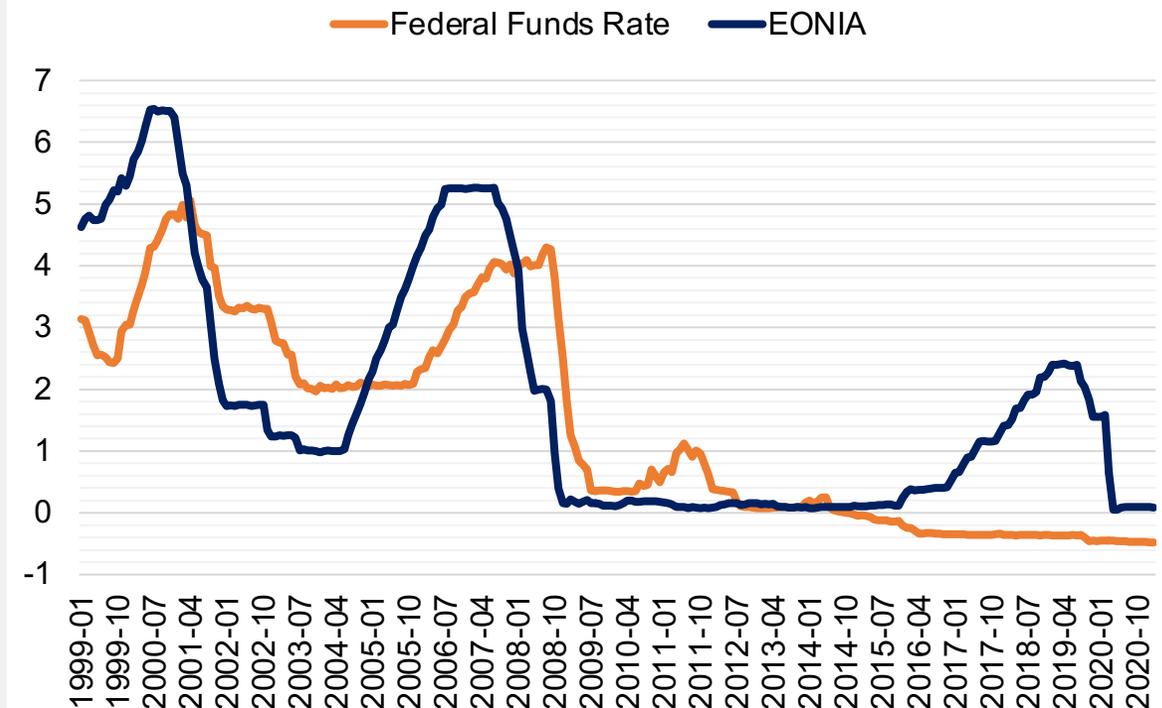
### 4) B-Bank grants money market loan to A-Bank A-Bank increases reserves to initial level of 5.000

Mr. Smith		A-Bank		Central bank (CB)		B-Bank		Mr. Miller					
Loan by A-Bank	1,000	Reserves at central bank	5,000	Refinancing loan CB	5,000	Reserves A-Bank	5,000	Reserves at central bank	5,000	Refinancing loan CB	5,000	Deposit at B-Bank	1,000
		Loan to Mr. Smith	1,000			Reserves B-Bank	5,000	Refinancing loan CB	5,000	Deposit by Mr. Miller	1,000		
				Refinancing loan to A-bank and B-bank	10,000			Refinancing loan CB	5,000	Interbank loan to A-Bank	1,000		

# How can the central bank control the process of money/credit creation?

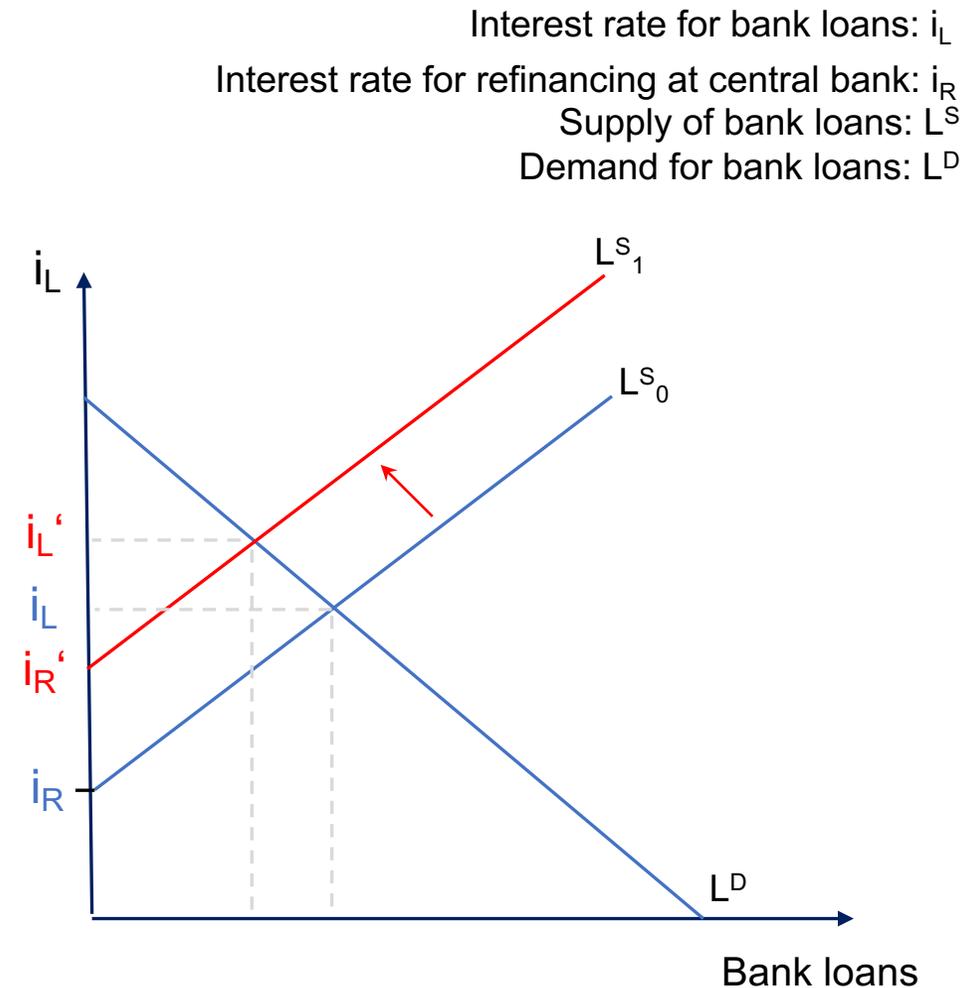
- For the **individual bank**, a loan in most cases - transactions a) and b) implies a reduction of its deposits with the central bank („reserves“).
- For the **banking system** transaction a) implies a shift of reserves which remain constant in aggregate.
- In order to maintain its level of reserves, the individual bank must refinance the loan
  - by lending from other banks (interbank lending on the money market)
  - by direct central bank refinancing
- With its instruments, a central bank can control the **interest rate on the interbank market** and the **refinancing rate**. In normal times, the two rates are very close.

**Short-term money market rates for the Dollar and the Euro**



# A simplified model for the supply and demand for money/bank loans

- The supply of money/bank loans comes from banks. It depends on
  - the interest rate for bank loans
  - the interest rate on the money market which reflects the refinancing costs for the individual bank
  - the perceived credit risks of a loan
- The demand for bank loans comes from
  - Private households (consumer loans, mortgages, speculation)
  - Firms (investment, mergers and acquisitions)
  - Governments
- The interest rate is a money interest rate. It is the price for liquidity
- The central bank can control this market. If it raises the refinancing rate, loans become more costly for banks. The credit supply shifts upwards (red line). The interest rate for loans increases and less loans are given.



# The failure of the classical model to identify the financial crisis



Source: Polizel Berlin

*"If these things were so large, how come everyone missed them?"*

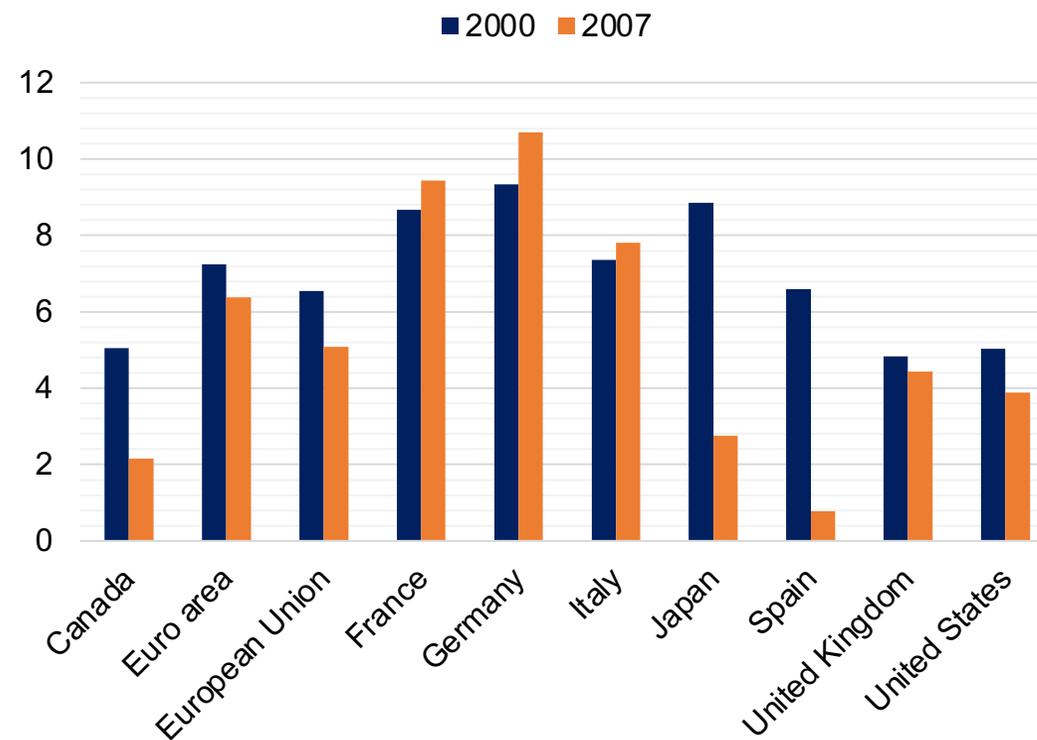
- The Queen commenting on the financial crisis while visiting the London School of Economics on 5 November 2008

# Explaining the financial crisis with the classical model

## Classical model

- Household saving is regarded as the source of financial funds. However, this is a rather stable aggregate.
- In the period from 2000 to 2007, household saving even declined in major countries, especially in Spain and the US, countries with a pronounced real estate boom

**Saving rate of private households**  
(Percent of disposable income)



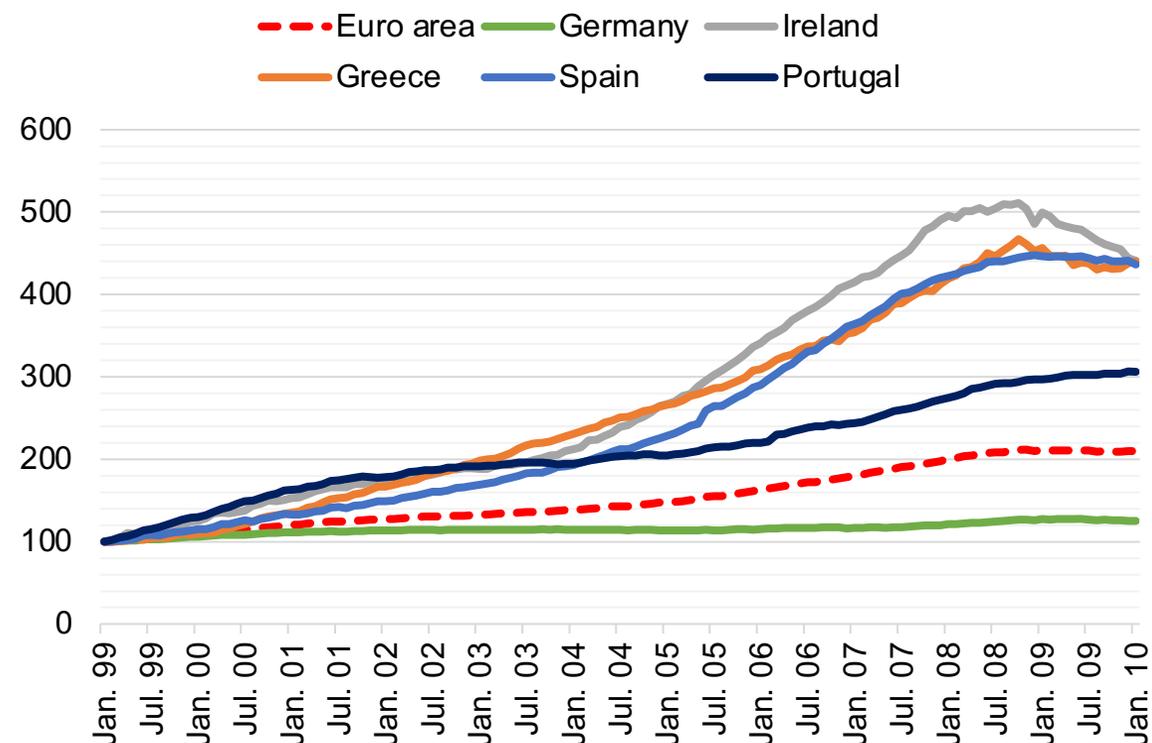
Source: OECD

# Explaining financial crises with the monetary model

## Monetary model

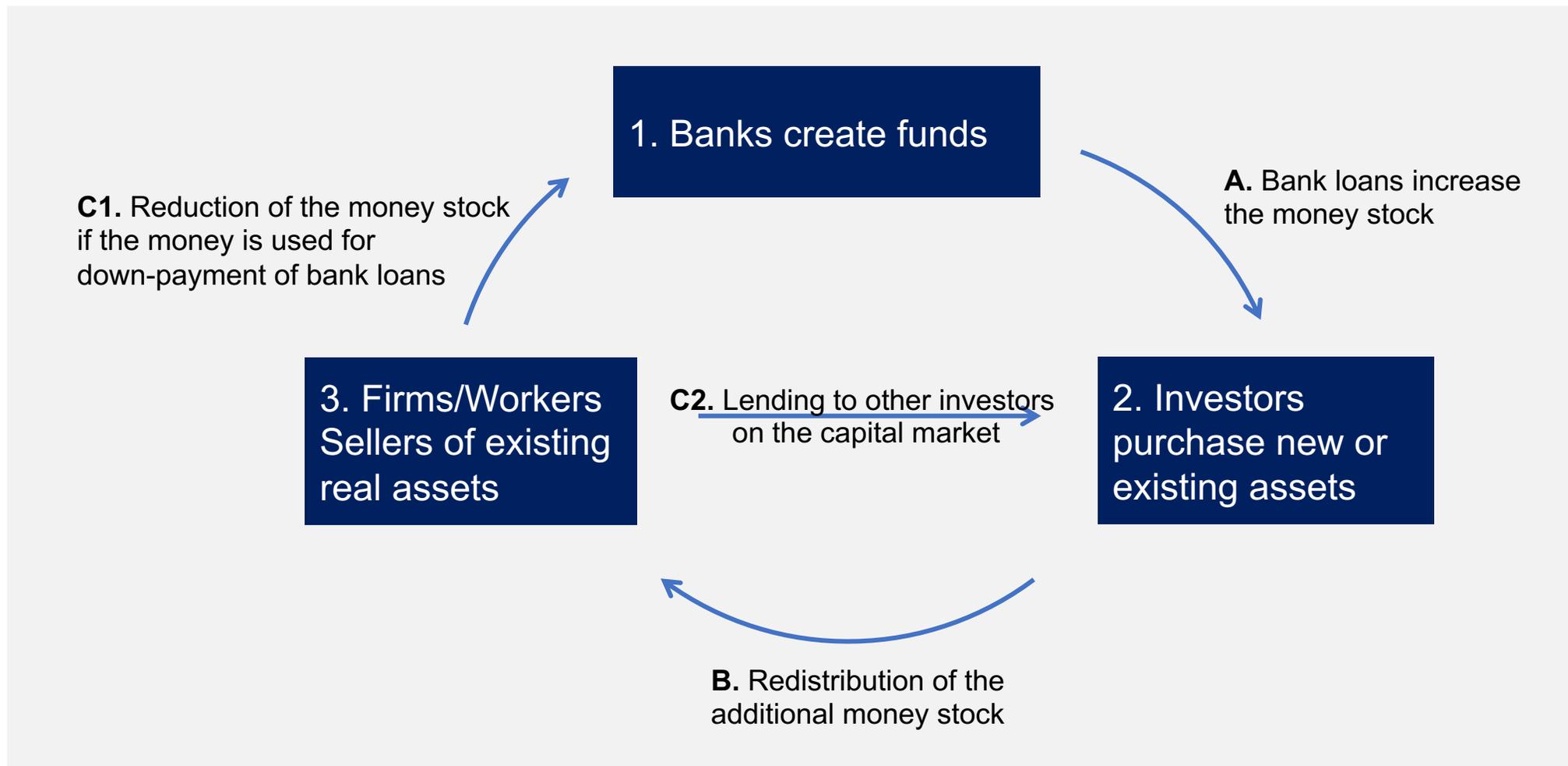
- The ability of banks to create loans out of nothing is very high as long it is not constrained by regulations (i.e. capital ratios, loan to value or income ratios)
- From 1999 to 2008, bank loans to the private sector increased by a factor of 5 in Ireland, and 4.5 in Spain and Greece. This created a housing boom and stimulated the economy
- In a real estate bubble, the price of house increases so that the value of bank collateral is also inflated
- If the bubble bursts, the bank collateral is insufficient which causes a banking crisis

**Bank loans to the private sector**  
(January 1999=100)



Source: Deutsche Bundesbank

# The circular flow of funds in the monetary model



# The flow of blood

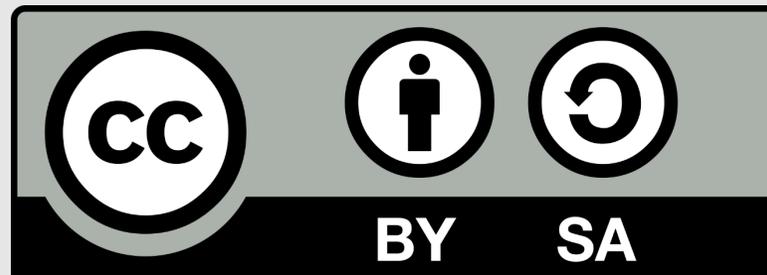
Source: William C. Aird (2011)

## One-way flow: Galen (129-216)

“He claimed that the liver produced blood that was then distributed to the body in a centrifugal manner, whereas air or pneuma was absorbed from the lung into the pulmonary veins and carried by arteries to the various tissues of the body. Arteries also contained blood, which passed from the venous side via invisible pores in the interventricular septum and peripheral anastomoses. This was **an open-ended system in which blood and air simply dissipated at the ends of veins and arteries** according to the needs of the local tissue.”

## Circular flow: William Harvey (1578-1657)

“In 1628, he published his momentous 72-page book, *On the Motion of the Heart and Blood in Animals*. Harvey employed experiment and deductive logic to show that arteries and veins are functionally, if not structurally, connected in the lung and the peripheral tissues, and that **blood circulates.**”



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