ECON1002: Introductory Macroeconomics

Lecture 9: The Reserve Bank, Monetary Policy and the Economy

8 May 2017

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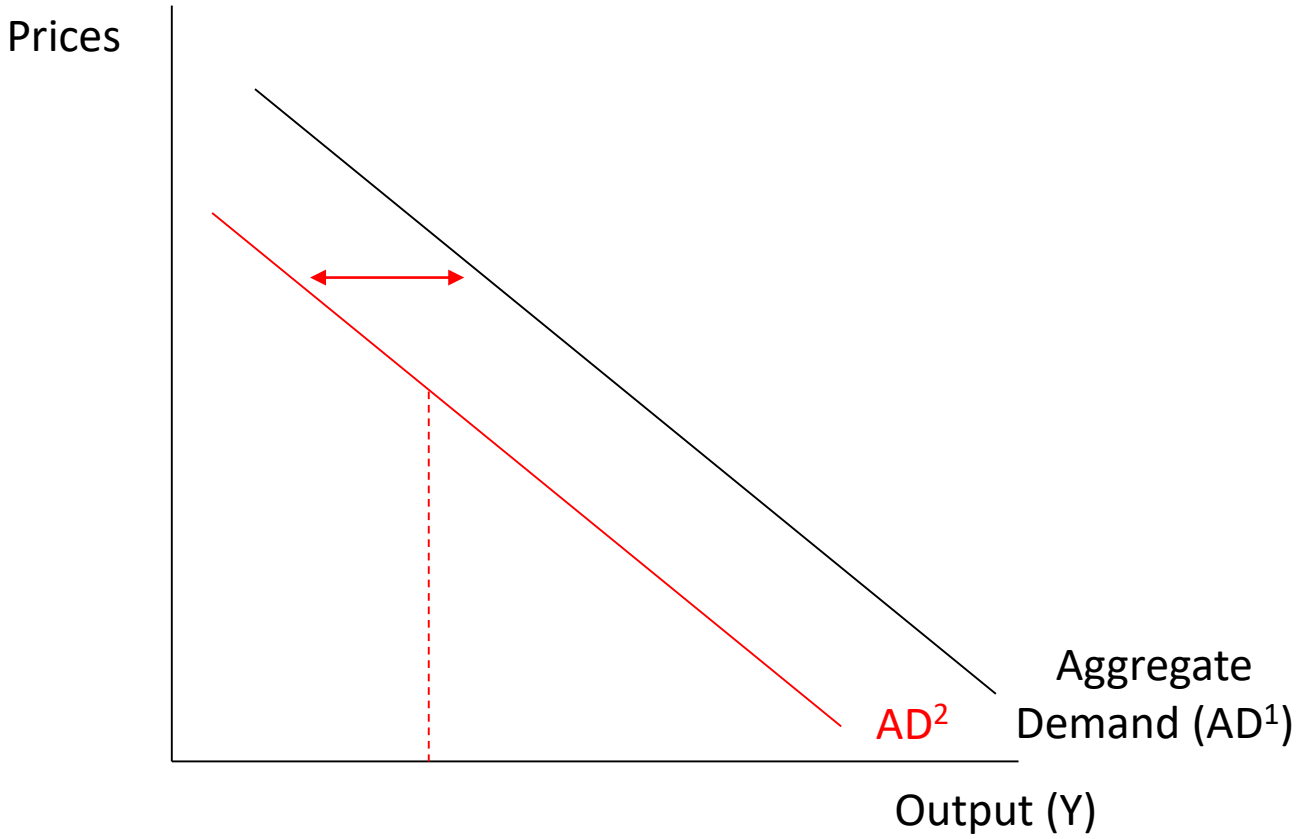
How to write an economics essay

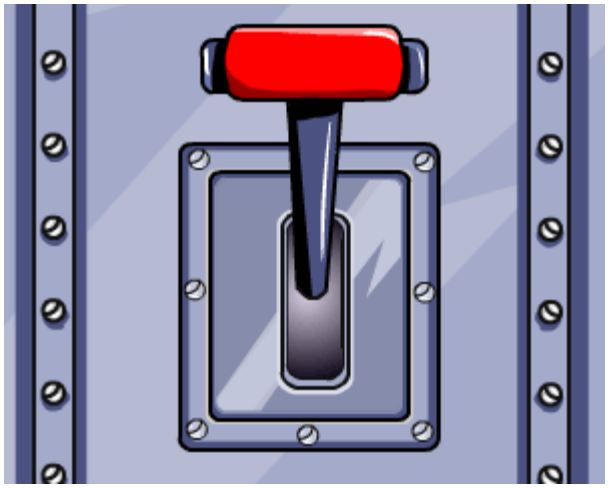
Recap from last lecture

We will continue to talk about ways that policymakers can influence aggregate demand, focusing on monetary policy



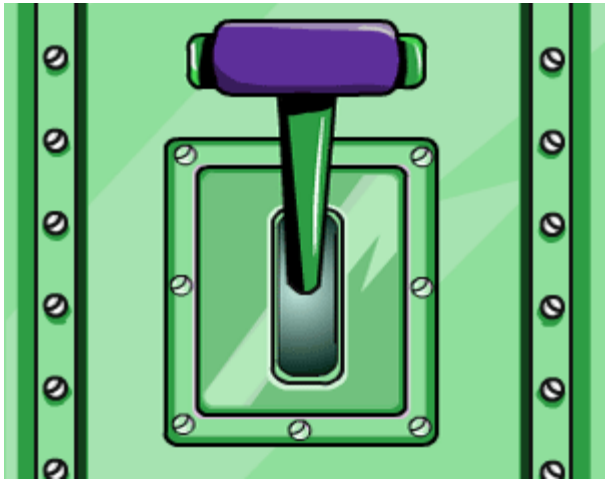
This lecture we will continue our focus on monetary policy

There are two main "levers" of economic policy in the economy:



Fiscal Policy:

- ***Engineer:*** the government
- ***Lever:*** taxes and spending
- ***Objective:*** full employment
- ***Considerations:*** Balanced budget over the business cycle
- ***Channel:*** Aggregate government demand (G)
- ***Reaction speed:*** slow



Monetary Policy:

- ***Engineer:*** the central bank (RBA)
- ***Lever:*** nominal interest rates
- ***Objective:*** Stabilize inflation (neutralize sticky prices)
- ***Considerations:*** Asset price bubbles
- ***Channel:*** Aggregate private demand (C, I, NX)
- ***Reaction speed:*** fast

Monetary policy is one of the most important topics in macroeconomics. It is in the news almost every day.

The Sydney Morning Herald | Business

NEWS SITE OF THE YEAR

RBA Governor Philip Lowe warns on house prices

Mathew Dunckley

- 4 May 2017

THE AUSTRALIAN BUSINESS REVIEW

ECONOMICS

RBA more confident that inflation will rise

- 5 May 2017

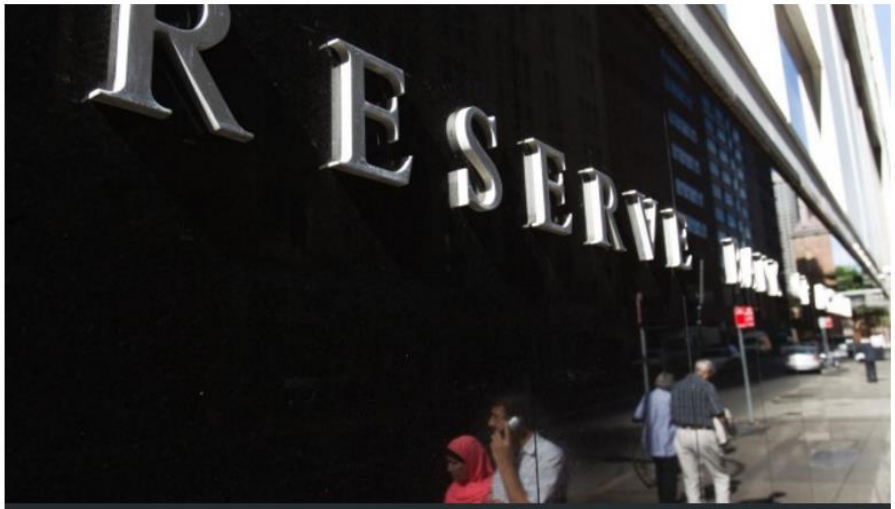
ABC NEWS

Westpac profit grows 6pc to nearly $4b for six months to March 31

- 8 May 2017

FINANCIAL REVIEW

Reserve Bank bets on economic recovery



The RBA is due to meet on Tuesday for its cash rate decision. **Louie Douvis**

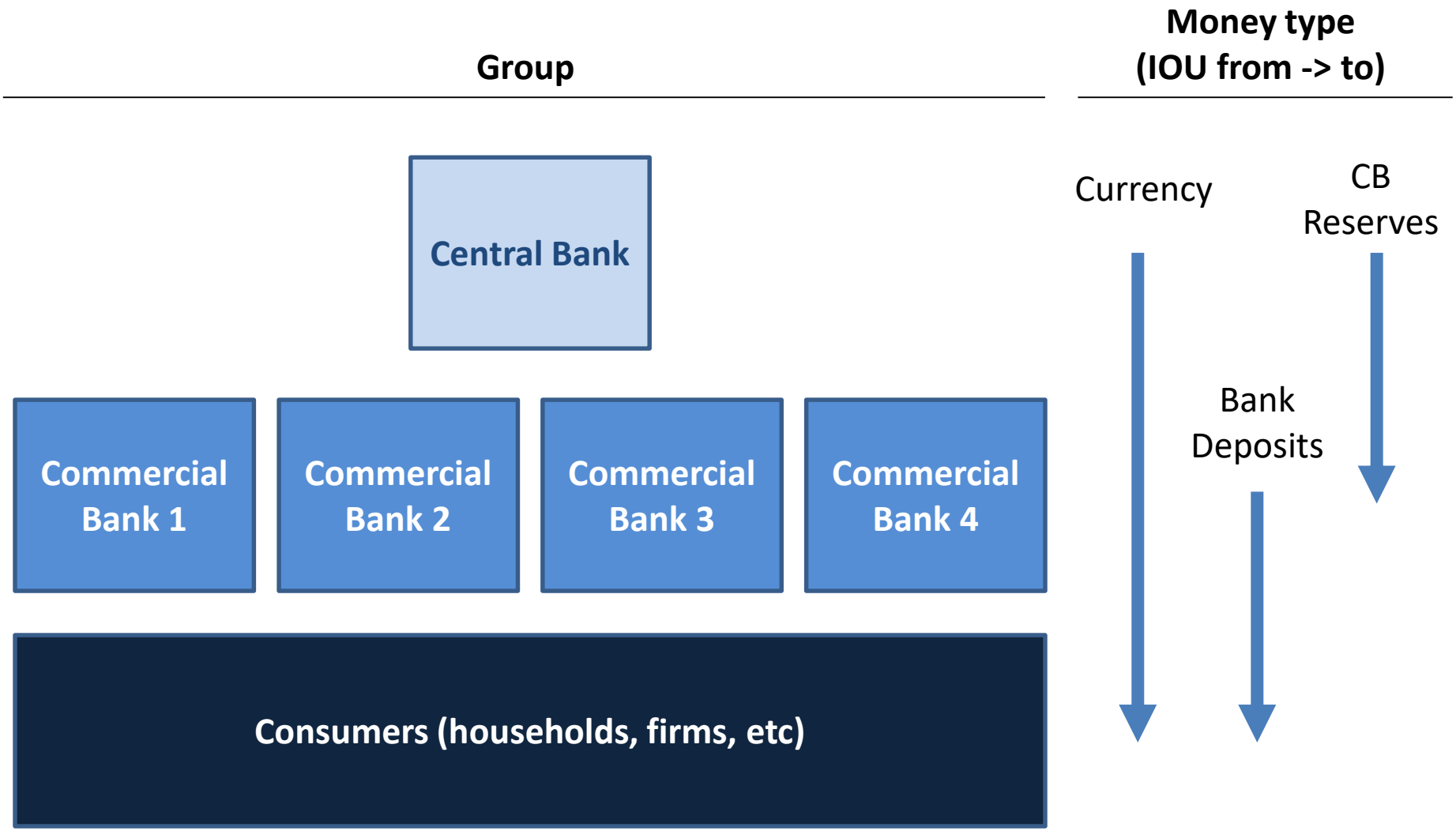
- 5 May 2017

Money is an IOU, stemming from its history as the receipt for goldsmith's coins

"I promise to pay the bearer on demand the sum of"

Today you can't redeem it for £5 of gold, but you can get another £5 note.

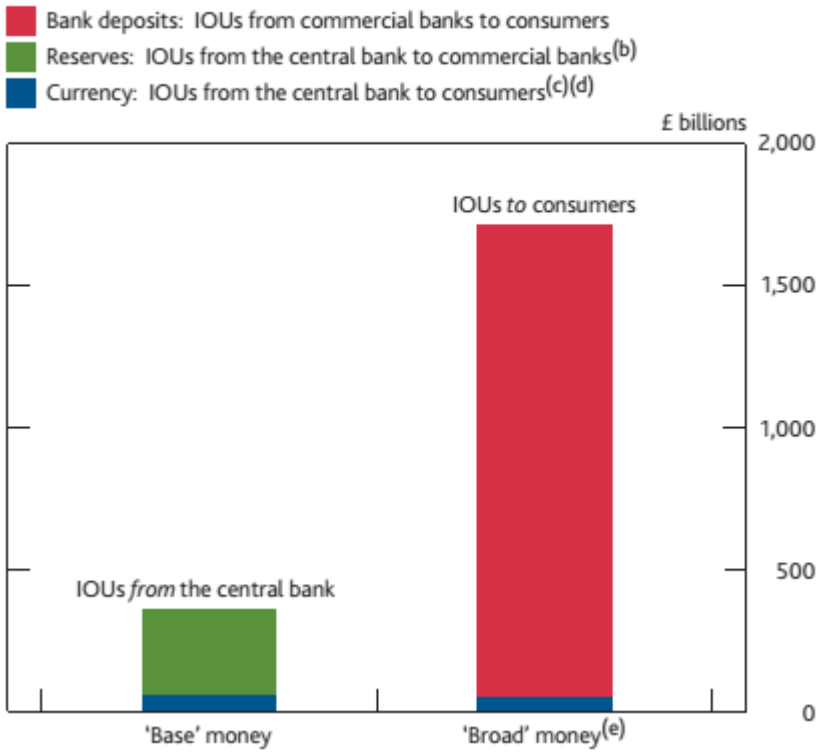
Modern money is a set of IOUs between three groups in the economy: the central bank, commercial banks and consumers.



In a modern economy bank deposits make up the vast majority of money held by households (97% in the UK)

Amounts of money in circulation in the UK, £ billions

Chart 1 Amounts of money in circulation[a]



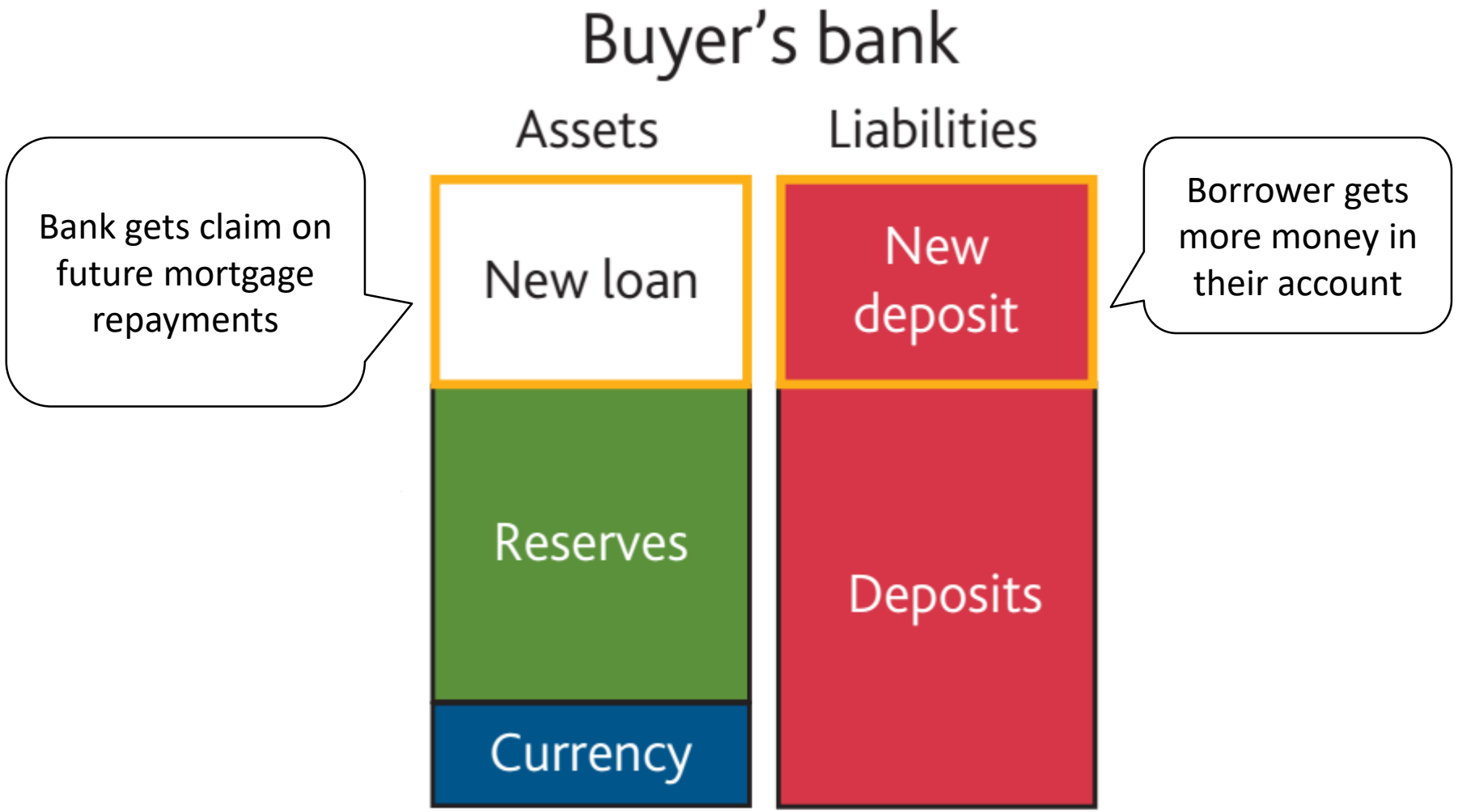
(a) All data are for December 2013.
(b) Reserves balances at the Bank of England held by banks and building societies, non seasonally adjusted. Data are measured as the monthly average of weekly data.
(c) Currency in base money includes notes and coin in circulation outside the Bank of England, including those in banks' and building societies' tills. Data are measured as the monthly average of weekly data.
(d) Currency in broad money includes only those notes and coins held by the non-bank private sector, measured as the month-end position.
(e) M4 excluding intermediate other financial corporations.

Source: McLeay, Radia and Thomas (2014), "Money in the modern economy: an introduction"

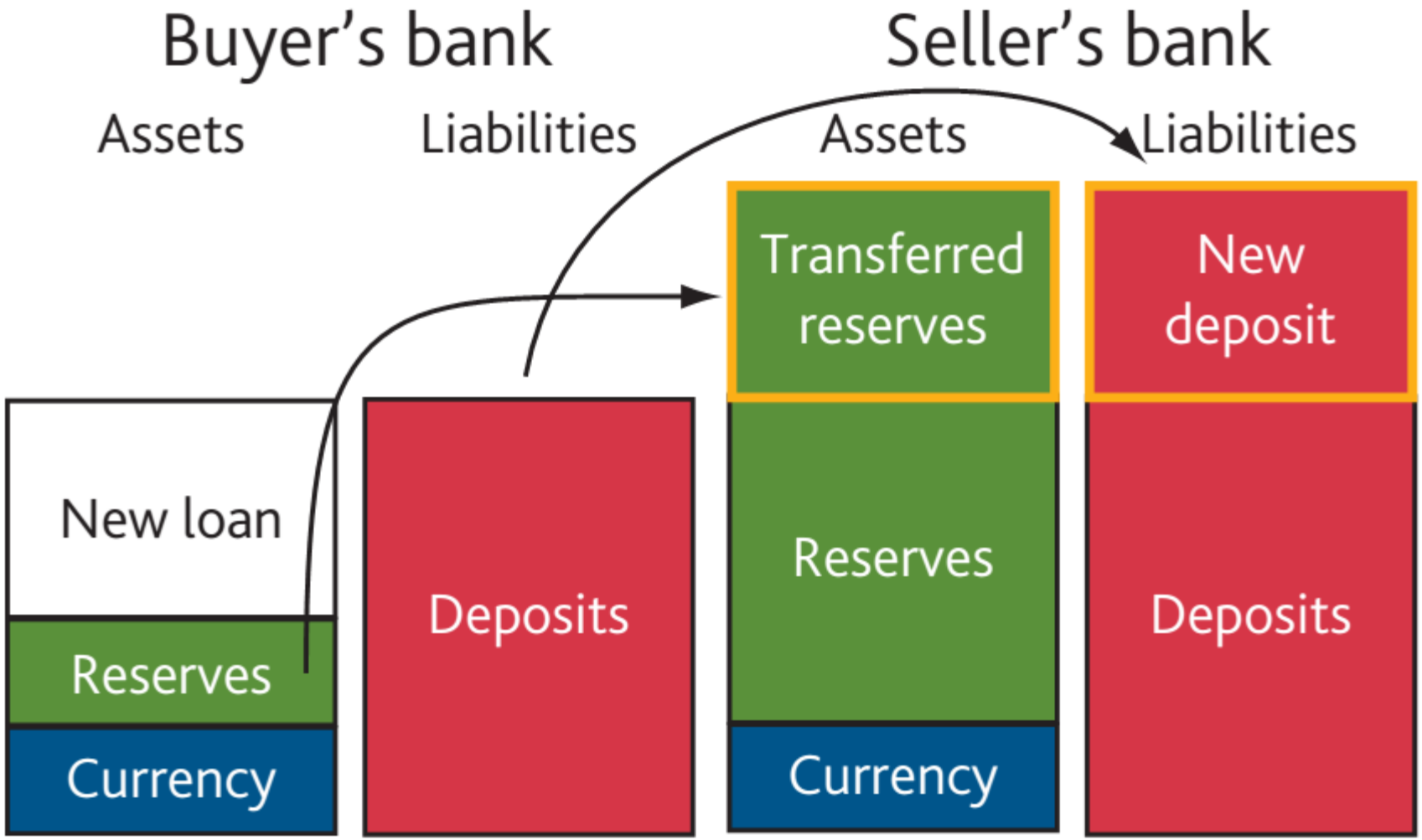
Commercial bank deposits, like all money, are IOUs, and so can be created at will by the bank. Banks create money out of nothing!

(..actually, it's created out of the trust that people place in their ability to redeem bank deposits…)

E.g. When a bank makes a new home loan, it just adds electronic numbers to the borrower's account. This increases total deposits.



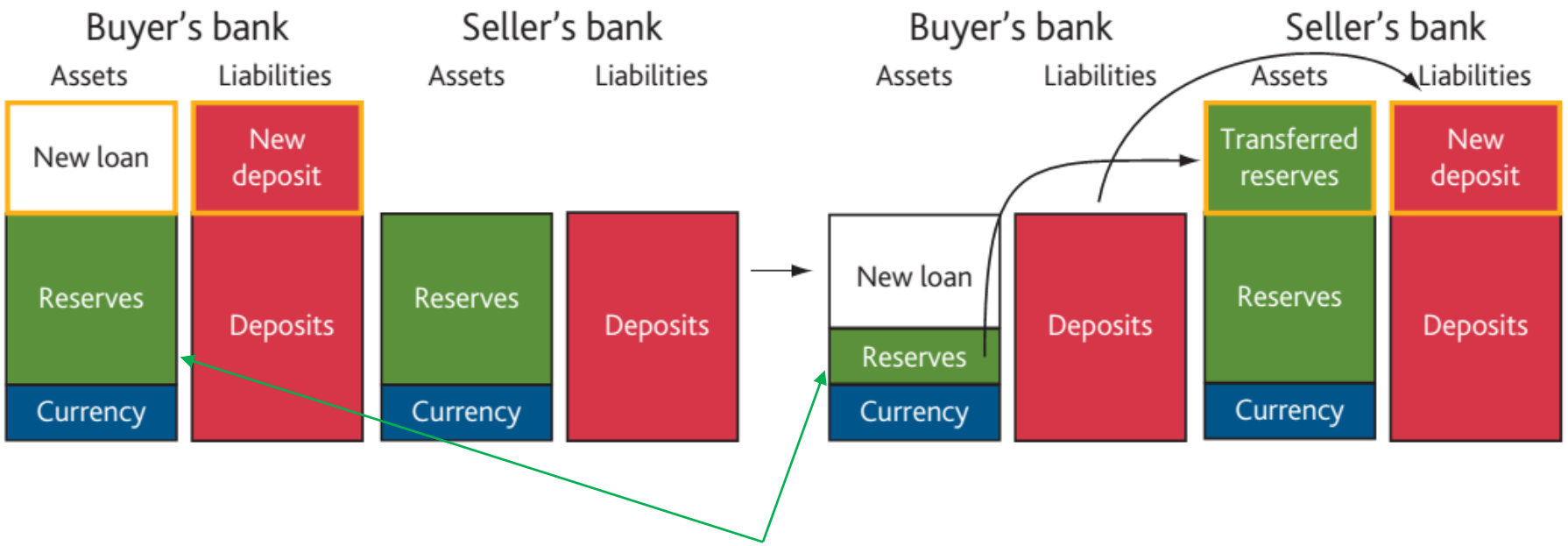
…The borrower will then withdraw the electronic numbers as cash (reserves) and give it to the house seller, who deposits with their bank



Why don't banks just lend money infinitely?? Because they need to make a profit, which is determined by interest on reserves

The commercial bank issues a new home loan…

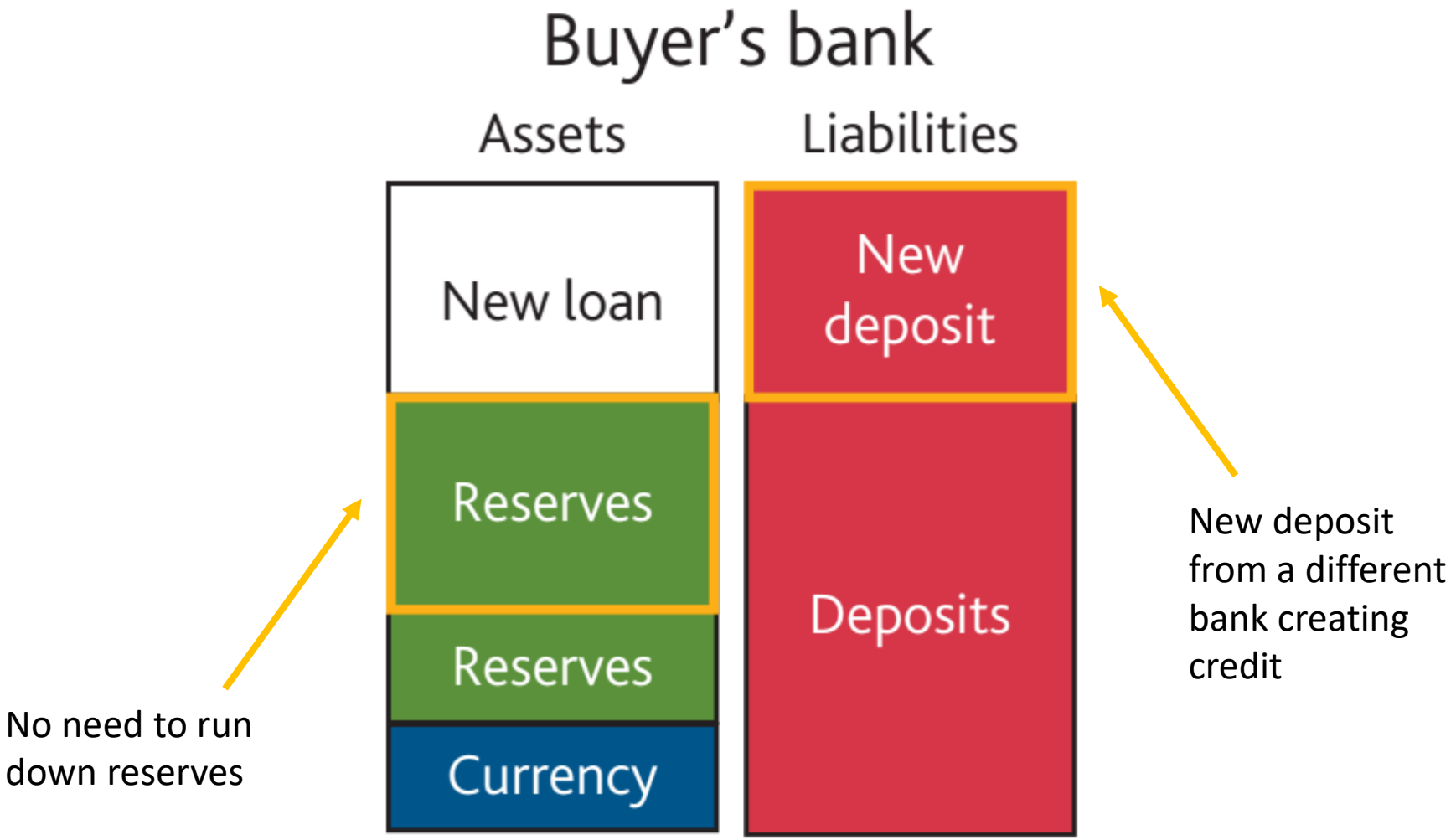
The borrower takes the money (reserves) and buys a house with them.



Less reserves than before, so miss out on the interest they earn at the Central Bank.

- High interest (cash rate) -> fewer loans
- Low interest (cash rate) -> more loans

But, when all banks are lending more, they will each also receive more deposits. Bank credit is self-reinforcing, leading to credit booms.



This Lecture

1. How does the Central Bank influence the money supply?
   - i. Aside: Bonds
2. Conventional monetary policy (interest rates)
3. Unconventional monetary policy (Quantitative Easing)
4. How does the Central Bank decide what interest rate to set?
5. How do interest rates affect the rest of the economy?

For this lecture the main text will again be an article from the Bank of England, supplemented with the BOF textbook

You must read the following two articles:

- McLeay, M., Radia, A., & Thomas, R. (2014). Money creation in the modern economy. *Bank of England Quarterly Bulletin*, Q1.

- Bernanke, Olekalns and Frank: Chapter 7 and 8

Learning Objectives

8.1 How does the Reserve Bank target the overnight cash interest rate?

8.2 What are the effects of the Reserve Bank changing the target for the overnight cash interest rate?

8.3 How does a change in the target rate for the overnight cash interest rate affect base money?

8.4 Under what circumstances can the Reserve Bank affect the real interest rate?

8.5 How does the Reserve Bank's monetary policy affect the equilibrium level of GDP in the short run?

8.6 What is meant by a monetary policy reaction function?

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If commercial banks create money, how does the central bank influence the money supply?

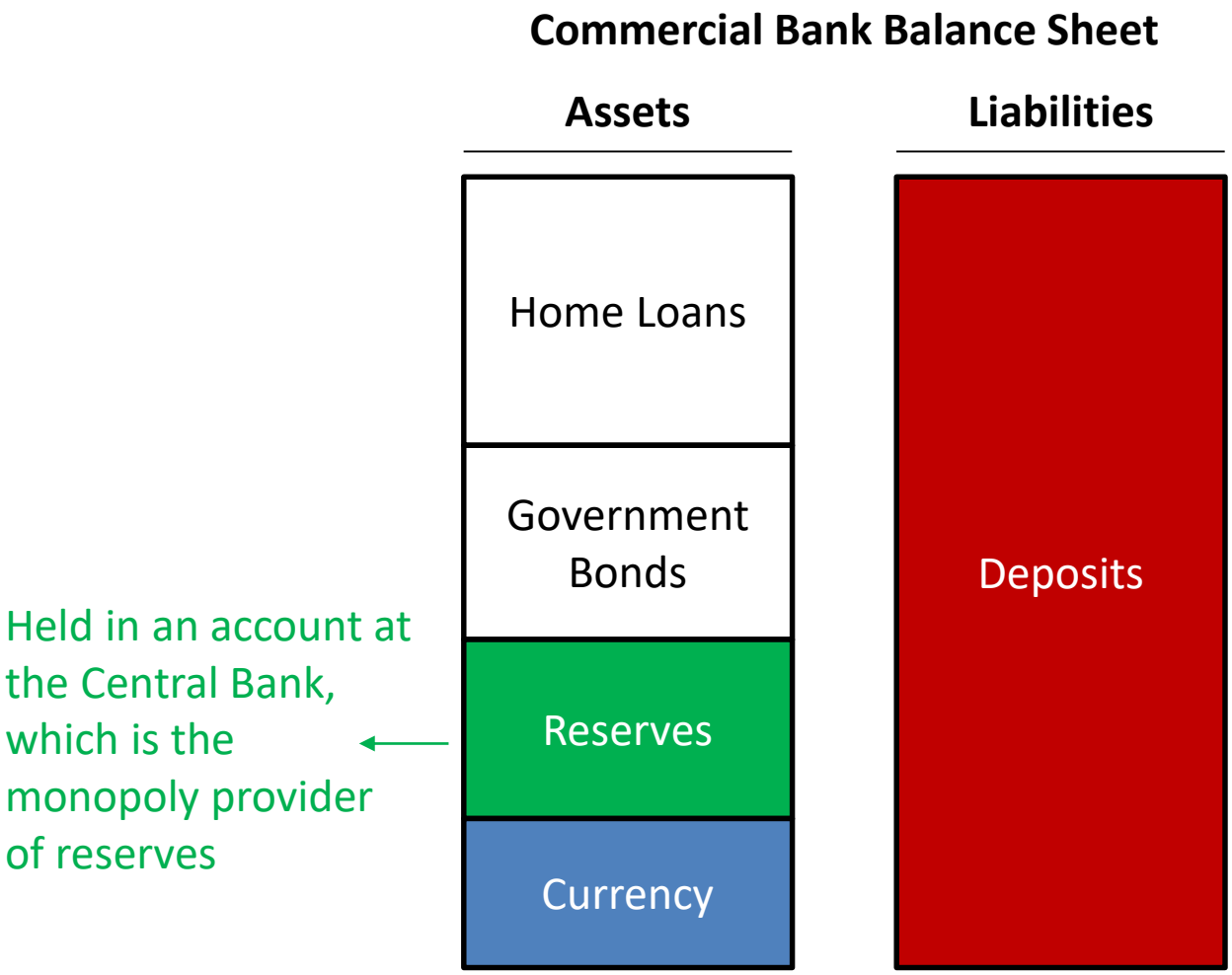

The Reserve Bank of Australia


The People's Bank of China

The US Federal Reserve


The Bank of England

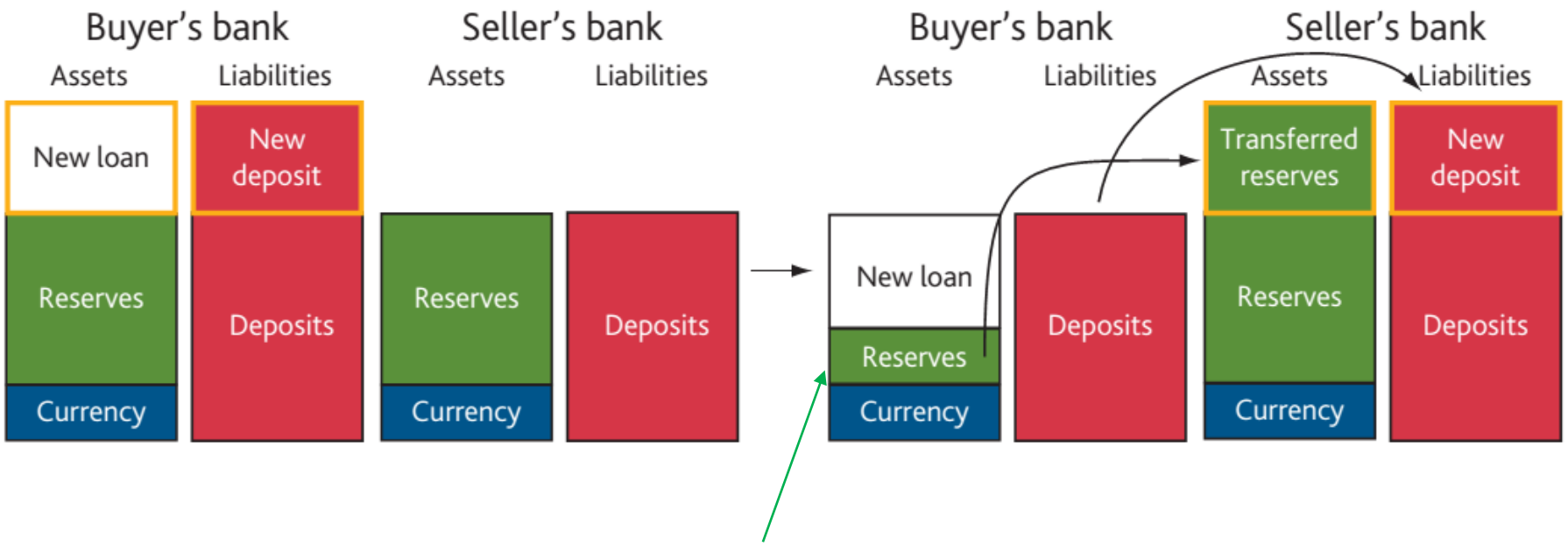
The Central Bank influences the amount of money the banks create by setting the cash rate, which is the interest paid on reserves



When a bank makes a new loan it involves transferring away some reserves (last lecture). This is costly if the reserves earn a lot of interest

The commercial bank issues a new home loan…

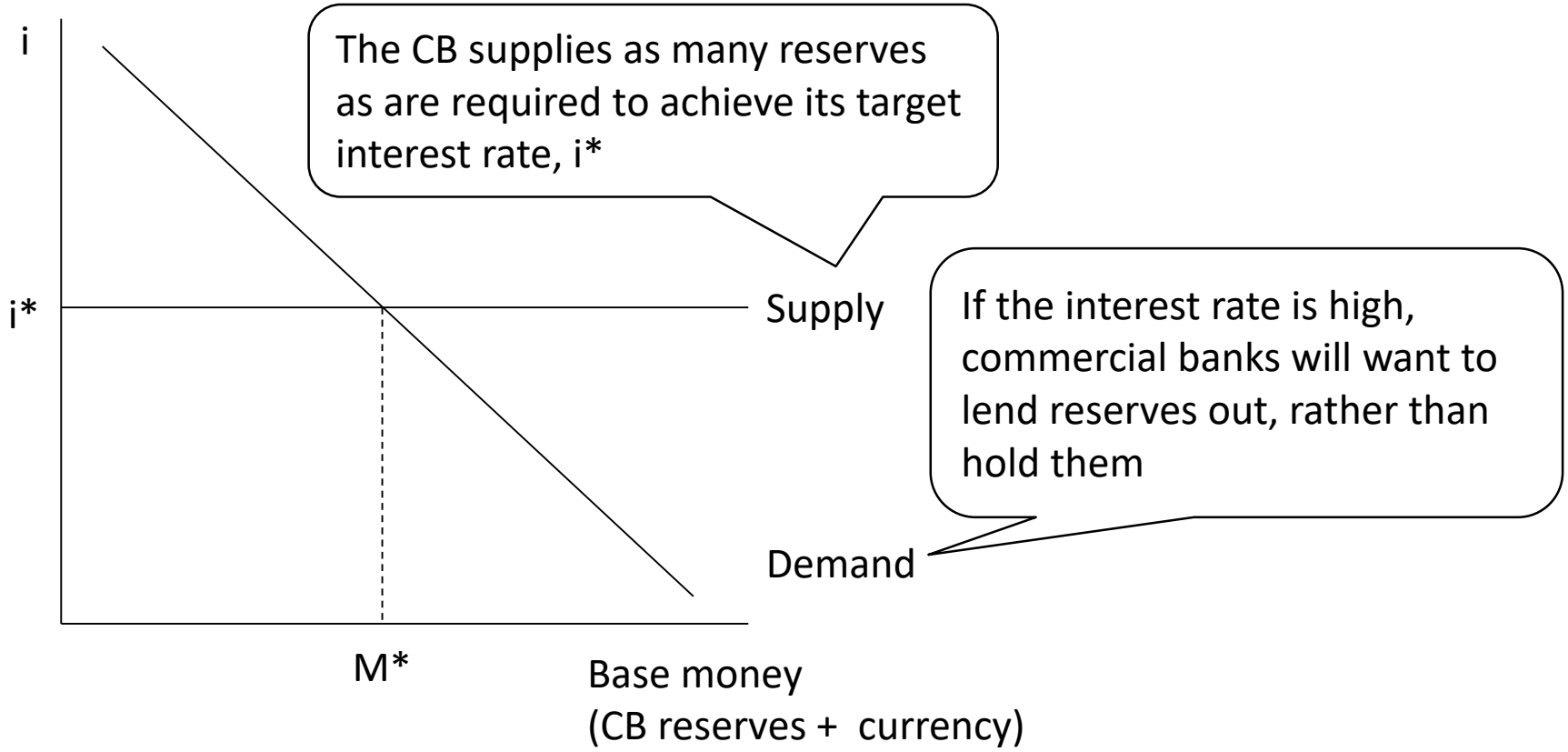
The borrower takes the money (reserves) and buys a house with them



Less reserves, so miss out on the interest they earn at the Central Bank.

- High interest (cash rate) -> fewer loans
- Low interest (cash rate) -> more loans

The Central Bank sets the cash rate by announcing what it will be, and then buying/selling government bonds from banks to make it happen



NOTE: This is different from Fig 8.3 and 8.4 in the BOF textbook, which assumes that the supply of reserves is vertical. In practice though, the Central Bank does not set the quantity of reserves. Instead, it provides as many reserves as needed to achieve its interest rate target. A horizontal supply curve is more consistent with this.

Interest rates on short-term bonds move closely with the cash rate

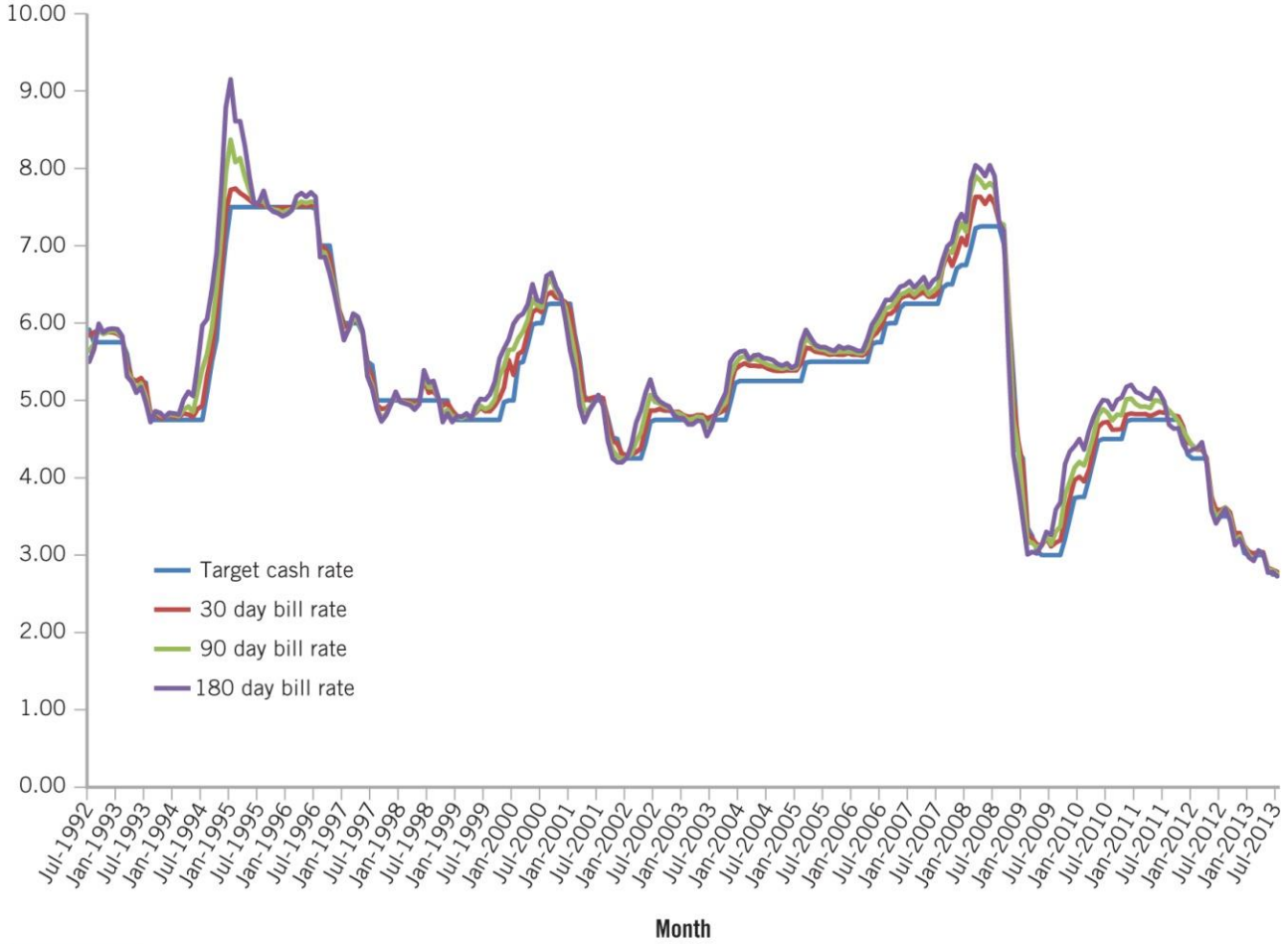


Figure 7.2 **Interest rates** There is a close connection between the overnight cash rate and other key interest rates in the economy.

Source: Reserve Bank of Australia, *Statistical Bulletin*, various issues

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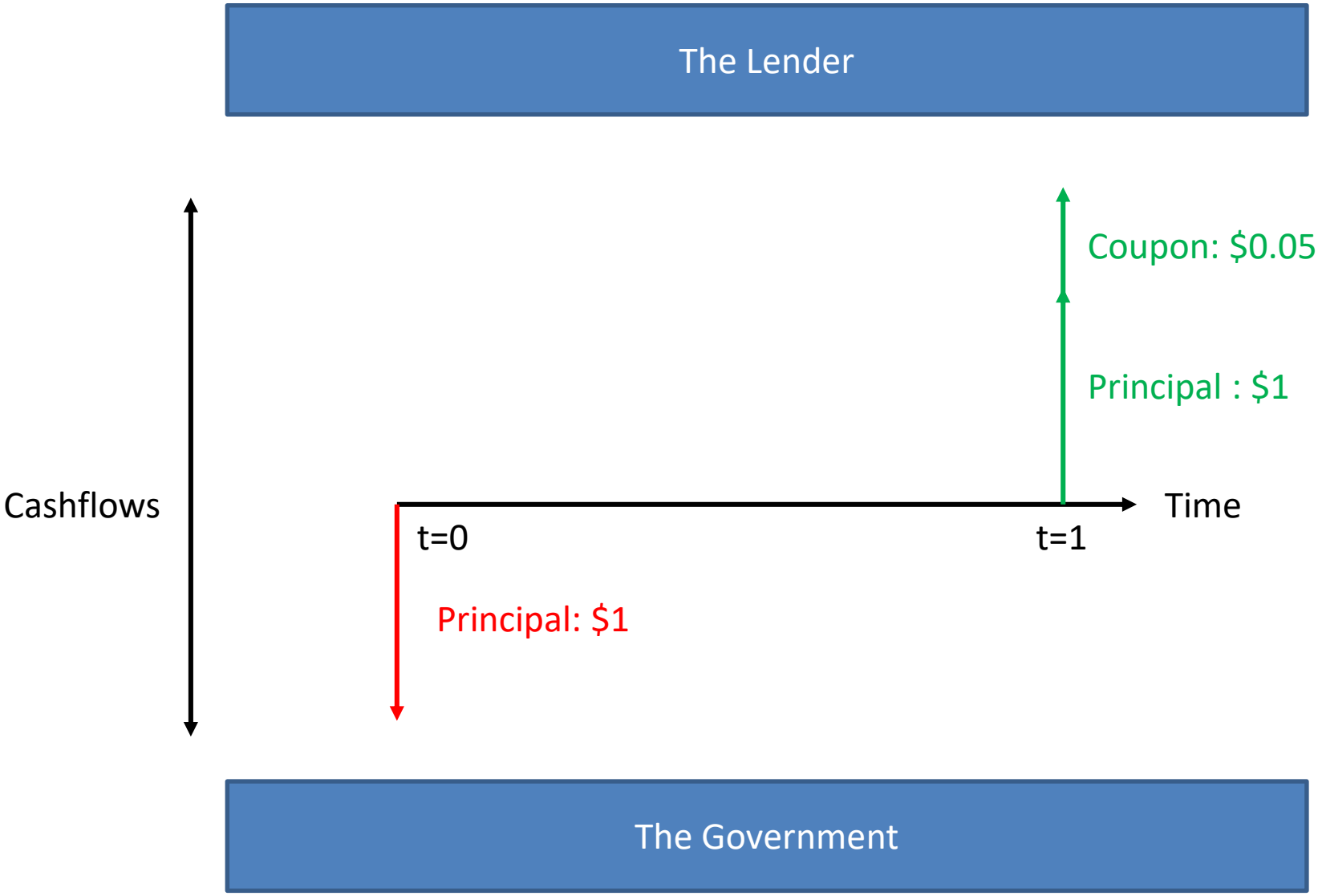
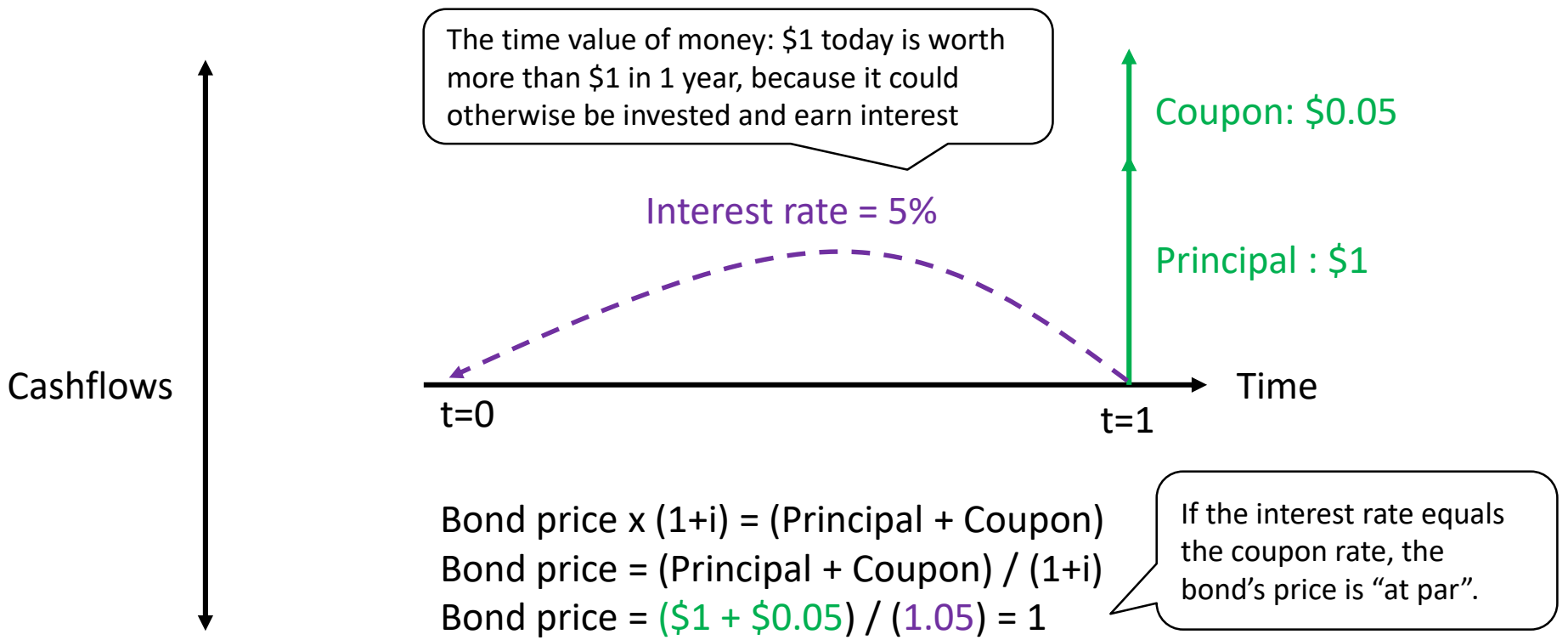
What is a bond? It is a loan to the government (a govt IOU), which can be bought and sold like other financial assets (eg stocks)



The price of a bond (how much the lender could sell it for) depends on the discounted value of future income (principal + coupons)

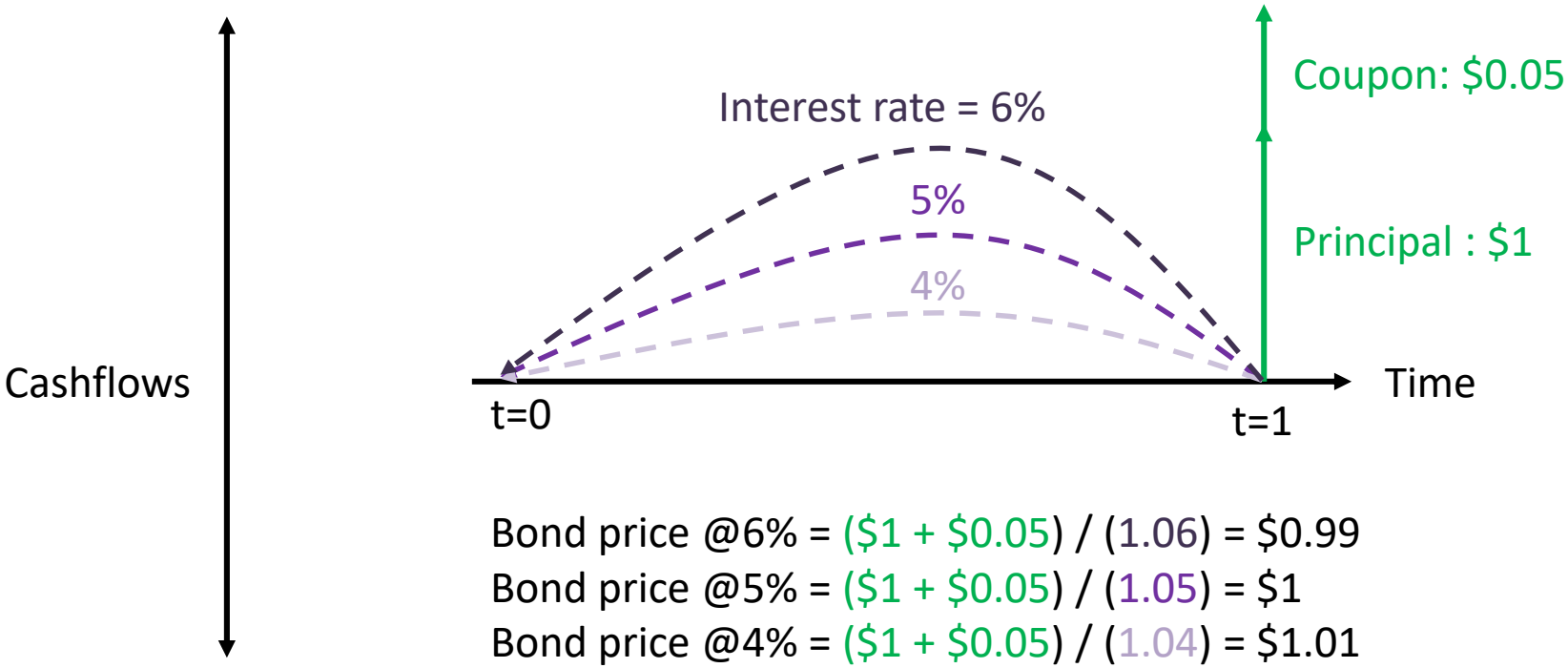
The Lender



The Government

A bond's price will vary inversely with the interest rate

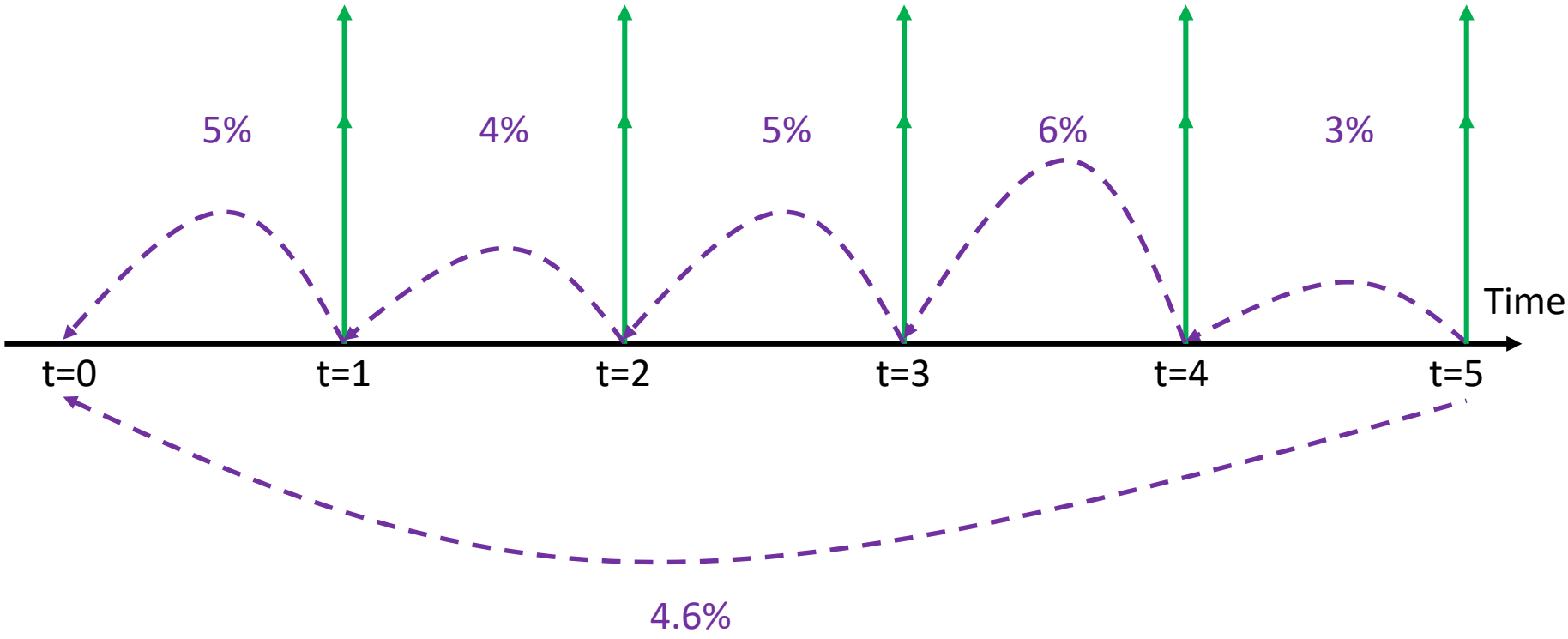
The Lender



Bond price @6% = ($1 + $0.05) / (1.06) = $0.99
Bond price @5% = ($1 + $0.05) / (1.05) = $1
Bond price @4% = ($1 + $0.05) / (1.04) = $1.01

The Government

Bonds can have different maturities. Their discount rates (yields) will differ based on expectations of cash rate changes & risk until maturity



$$(1.05)(1.04)(1.05)(1.06)(1.03) = (1.046)^5$$

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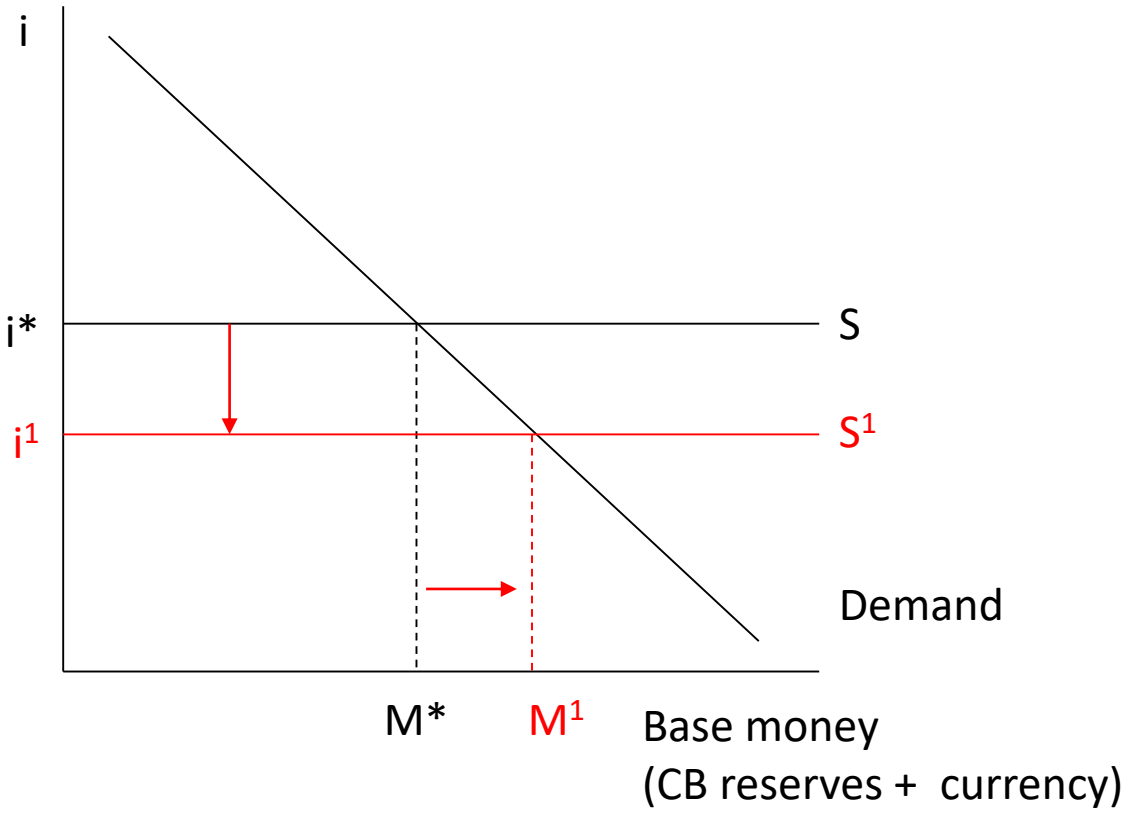
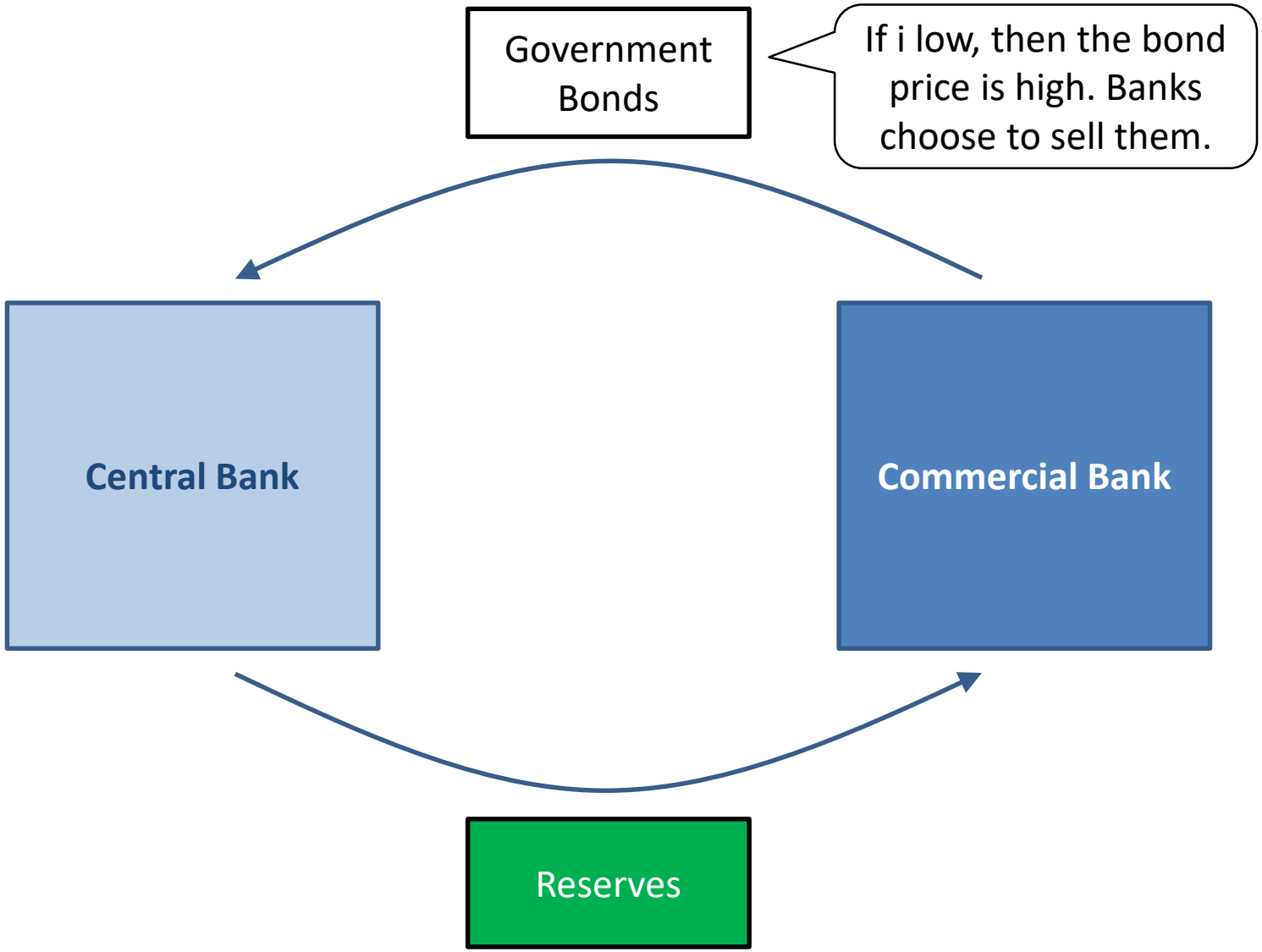
If the Central Bank decides to lower interest rates, then Commercial Banks will want to sell bonds and buy more reserves

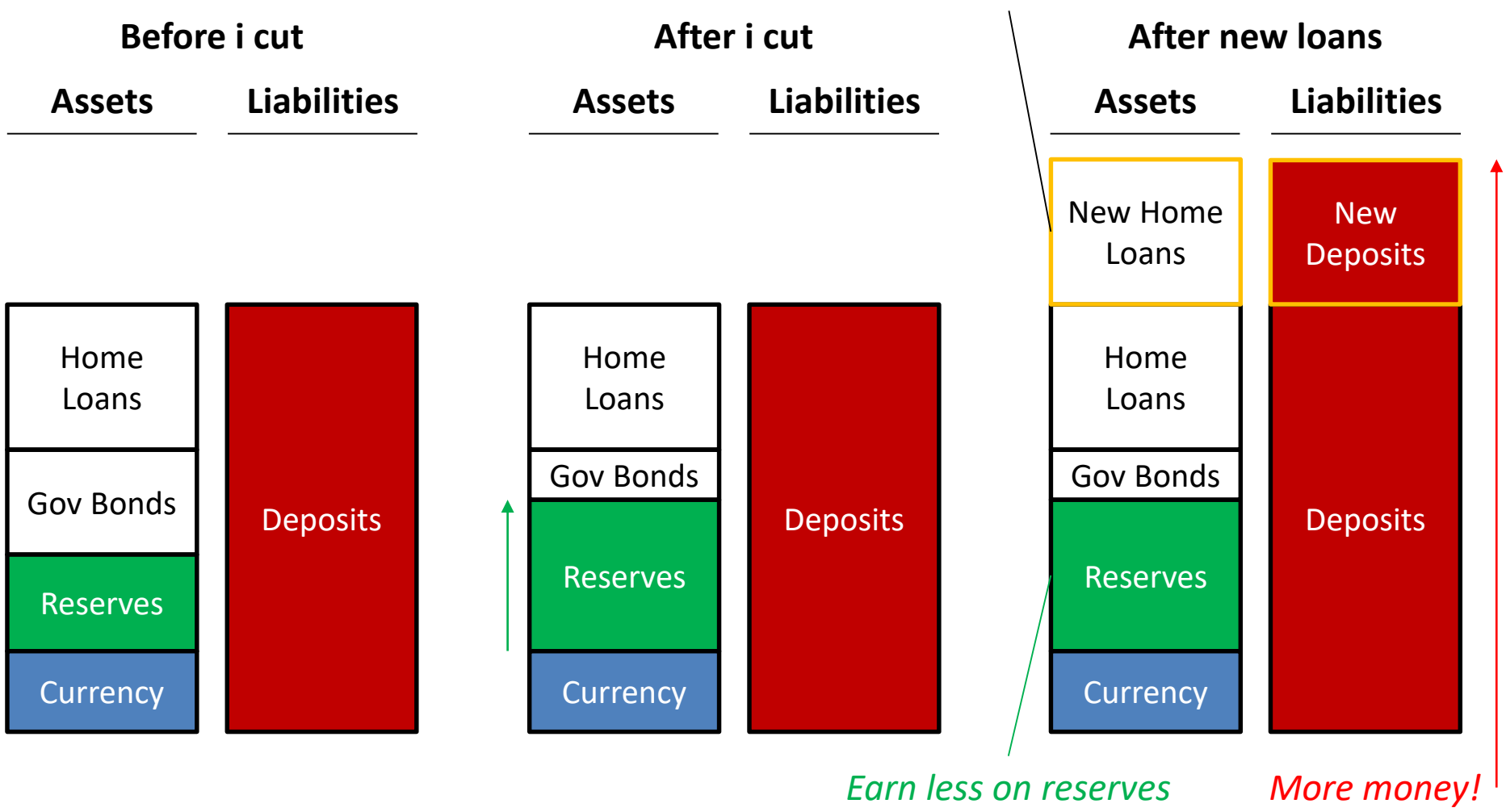


To get more reserves the Commercial Banks will sell some government bonds to the Central Bank, in exchange for reserves



After the interest rate cut banks will have more reserves, and make more loans as more projects will be profitable, increasing the money supply

Commercial Bank balance sheets

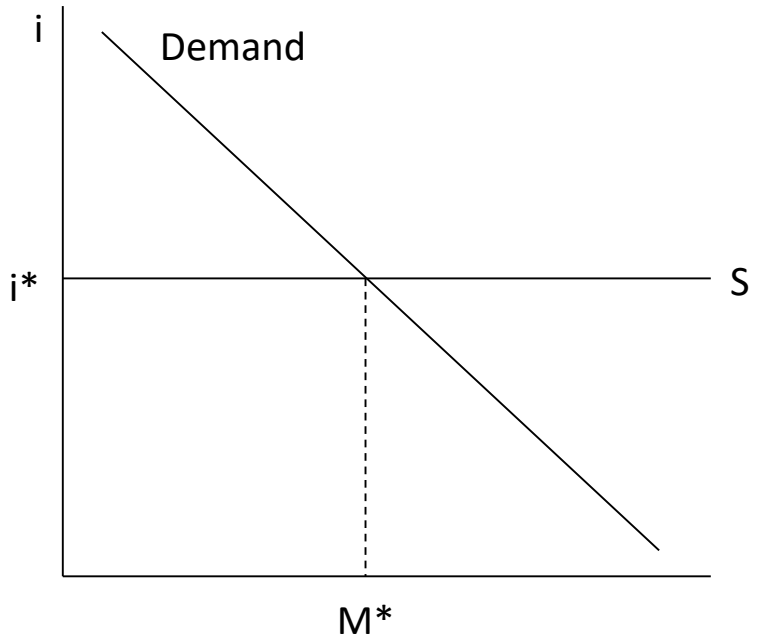


People used to think that the money supply was the important variable to control, rather than the interest rate. They were the “Monetarists”.

Milton Friedman,
1976 Nobel Prize in Economics
Leading Monetarist

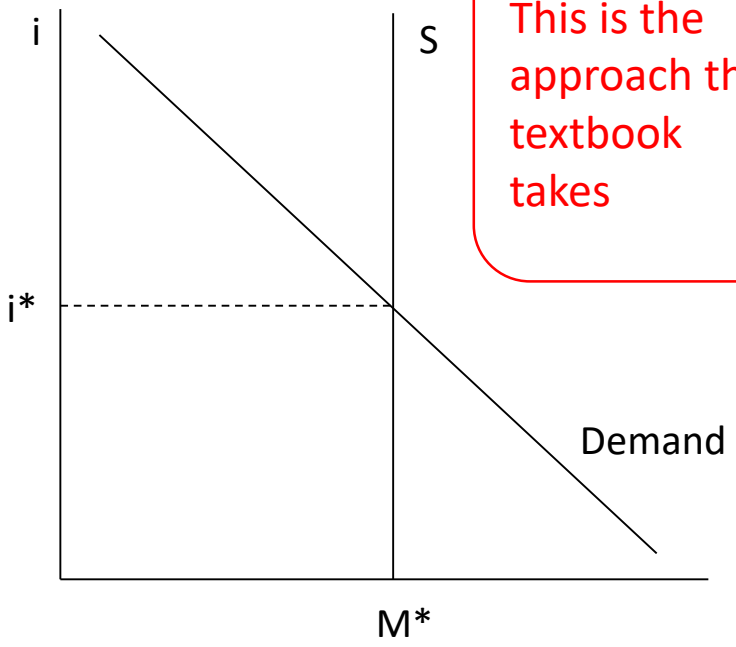
Monetarists thought that controlling the money supply was better than controlling the interest rate

Now



Now monetary policy announces a cash rate target and varies M* to meet it

Then (monetarism in the 1970s)



This is the approach the textbook takes

Then monetary policy announced a money supply target

Monetarism didn't work for two reasons: i) the CB doesn't directly control money supply and ii) money supply doesn't directly affect GDP

i) The Central Bank doesn't directly control the money supply

- We have already seen that commercial banks create >90% of money

ii) The money supply doesn't directly affect real GDP or inflation

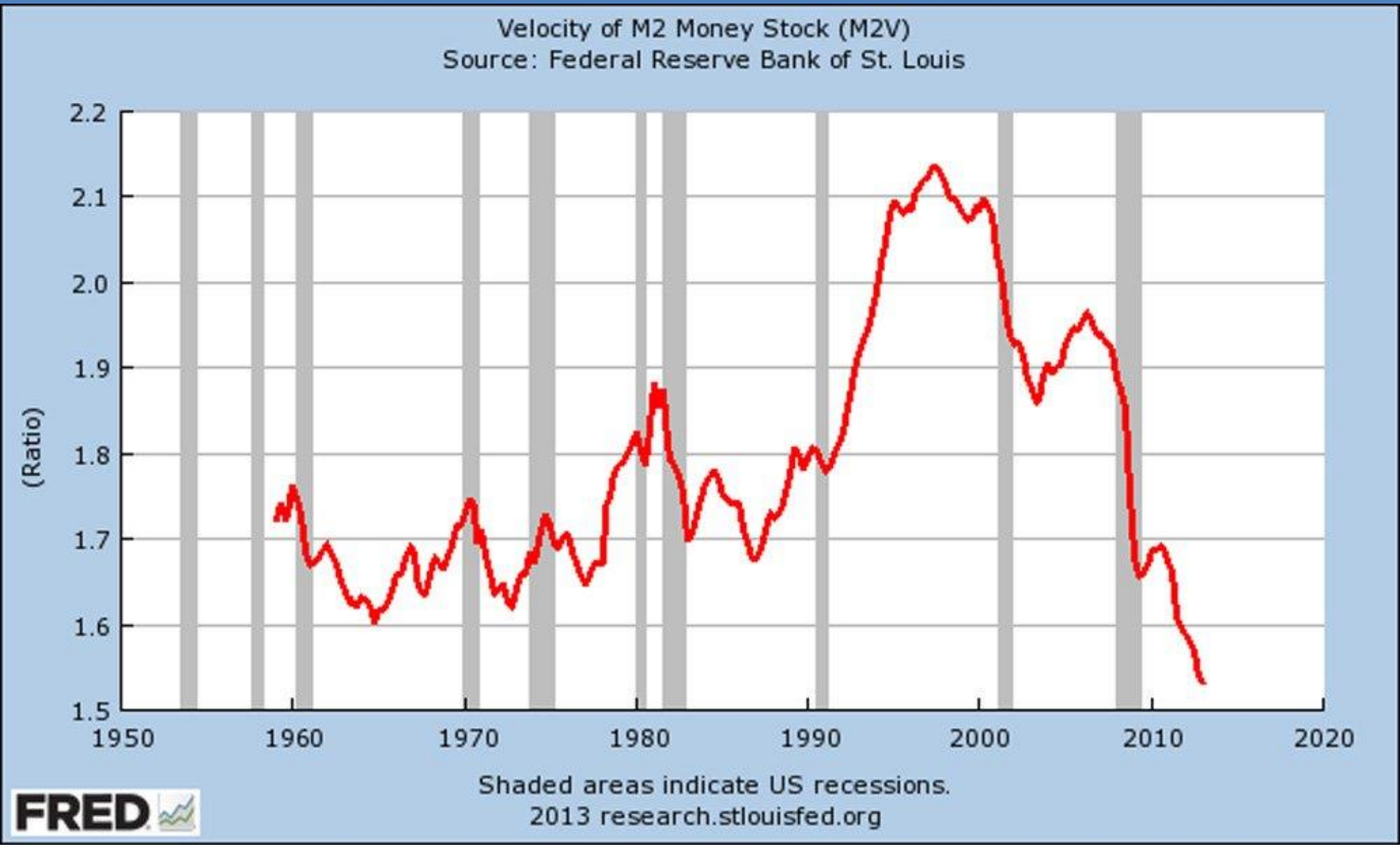
$$M V = P Y$$

Quantity of money — *Velocity of money*

Price level — *Real GDP*

- Velocity measures how much expenditure can be financed from a given amount of money over a particular time period.
- It is usually calculated as a residual

ii) The money supply does not directly affect prices or GDP because the velocity of money can change a lot



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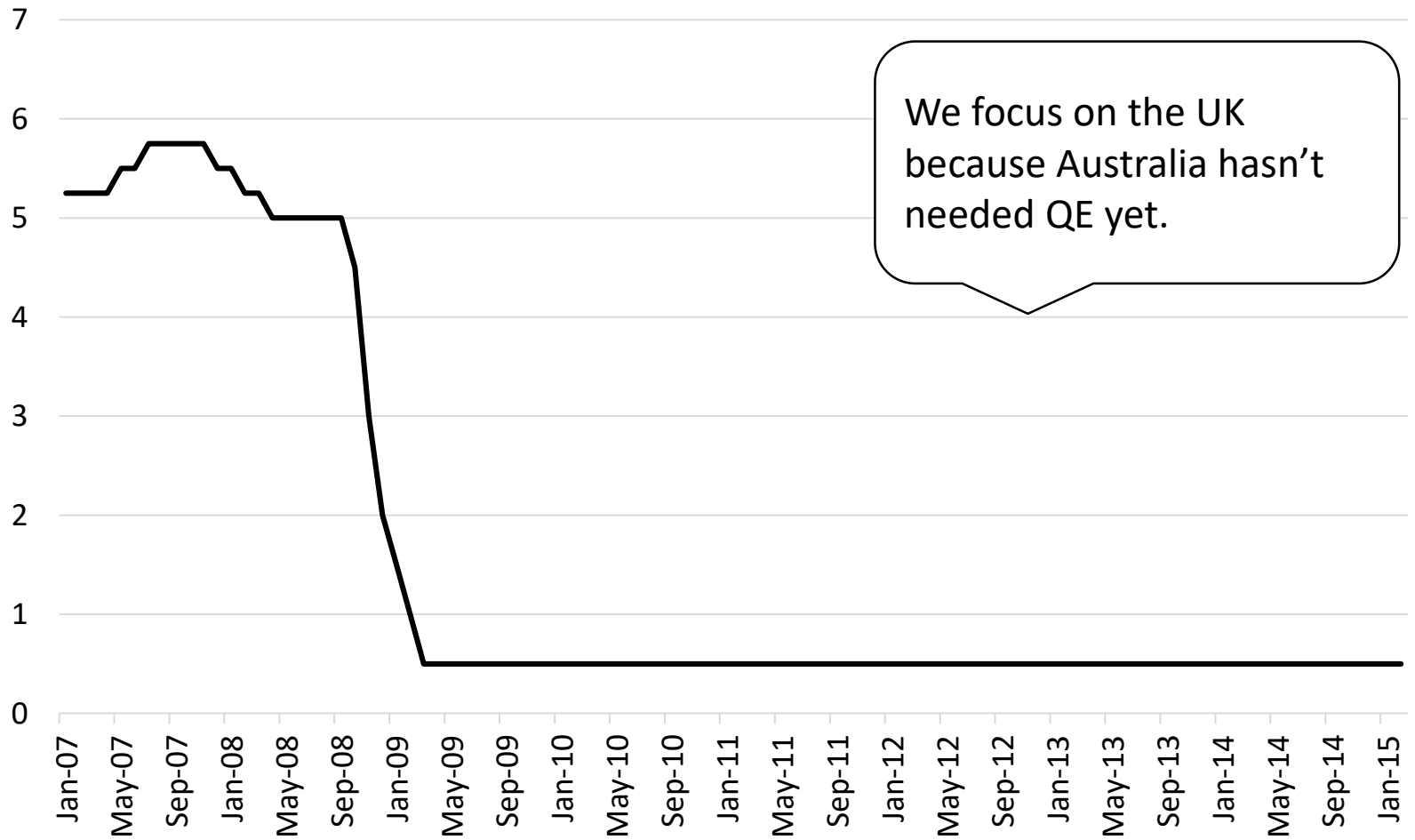
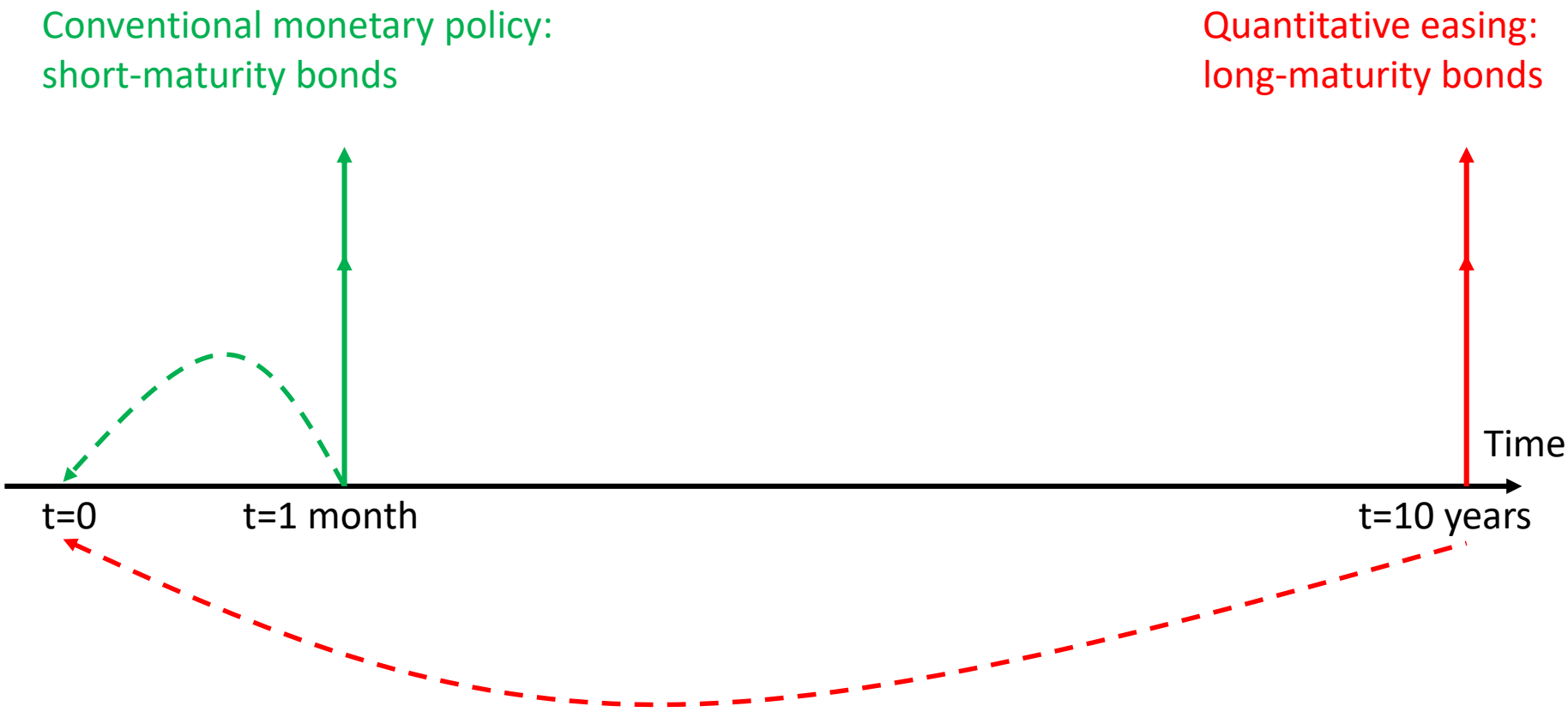
During the financial crisis, many countries (including the UK) found that monetary policy stopped working because interest rates approached zero

UK bank rate, %



Source: Bank of England

Conventional monetary policy uses reserves to buy short-maturity bonds. QE uses reserves to buy longer-maturity bonds



While monetary policy lowered the yield on short-maturity bonds, the yield (/discount rate) on long-term bonds stayed high (due to risk)

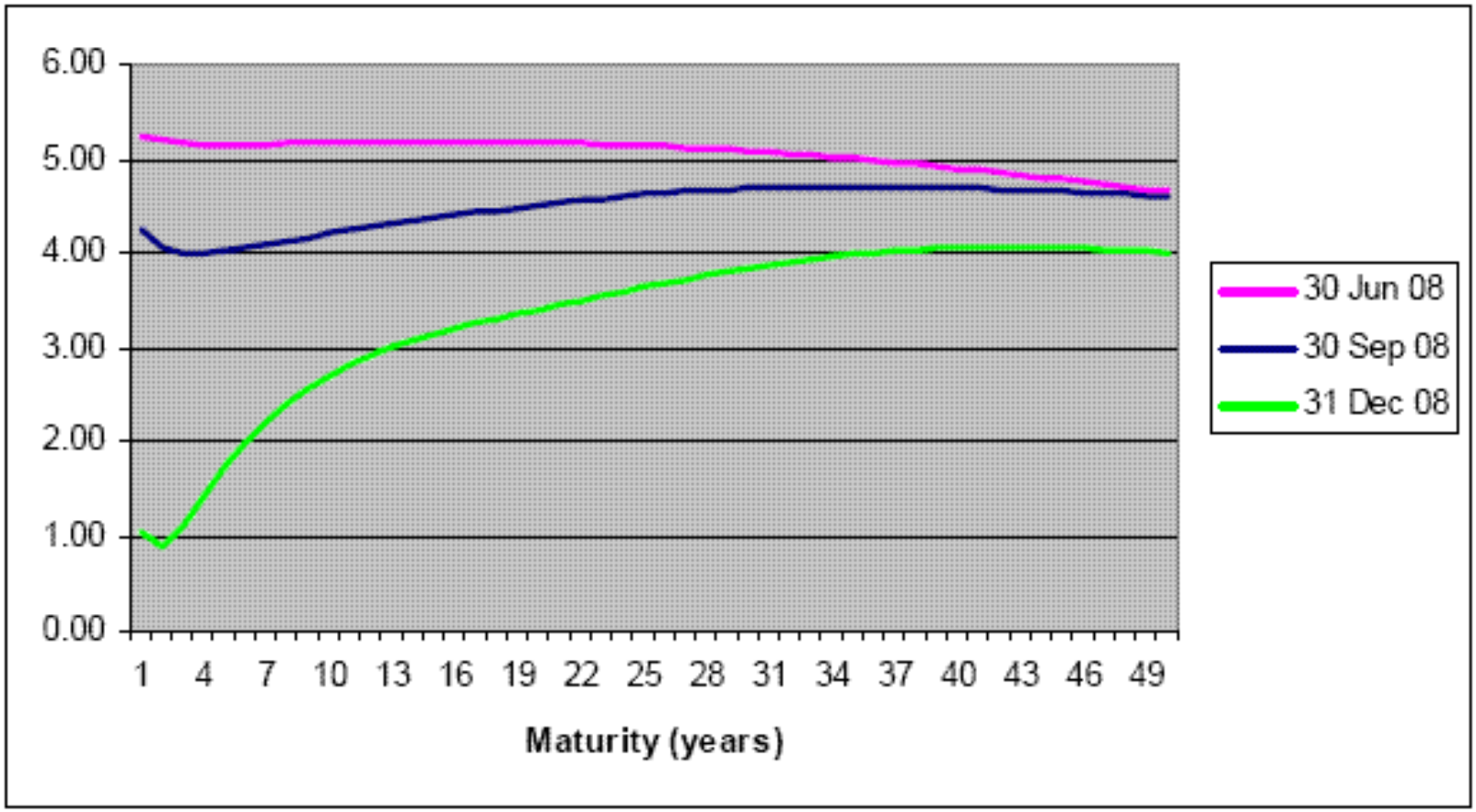
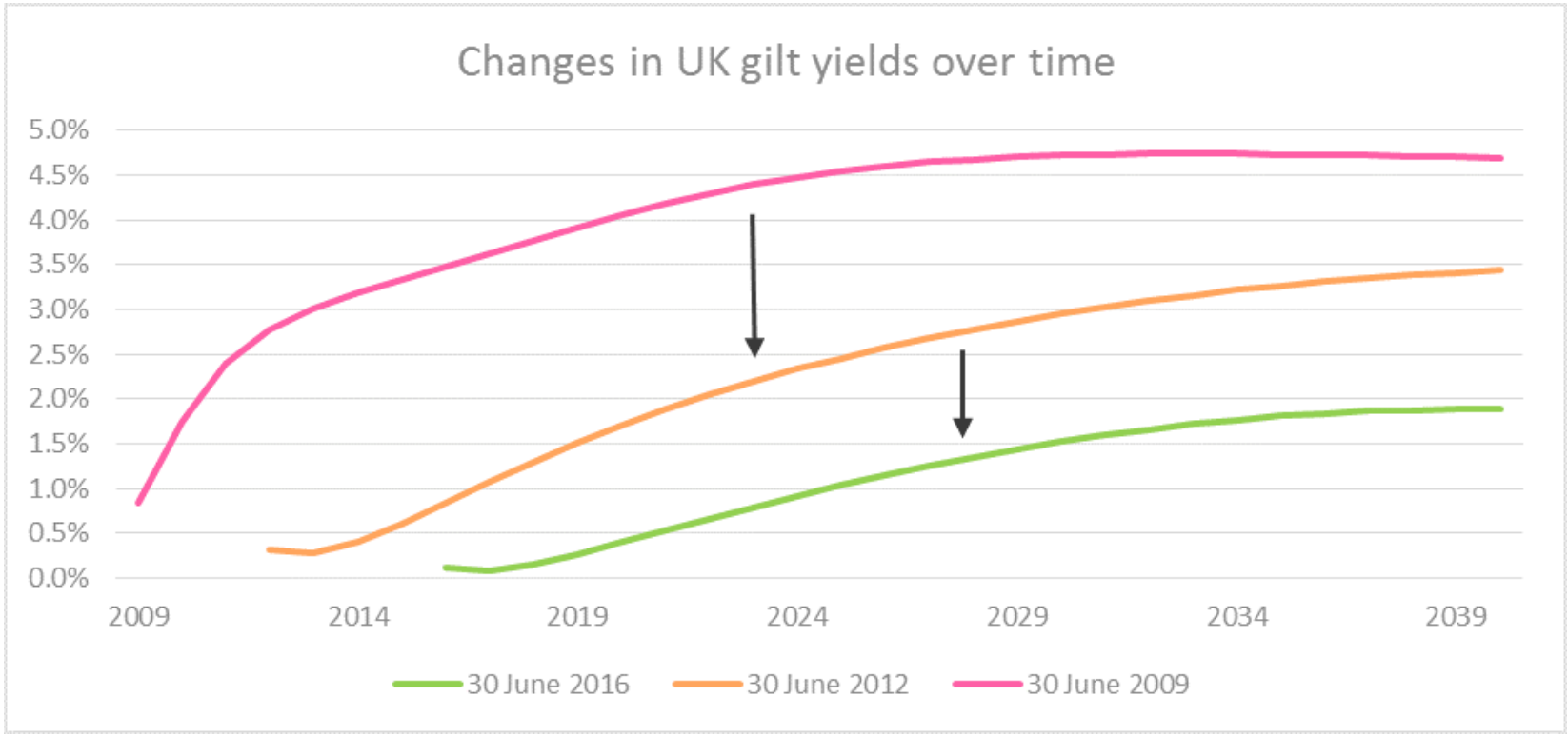


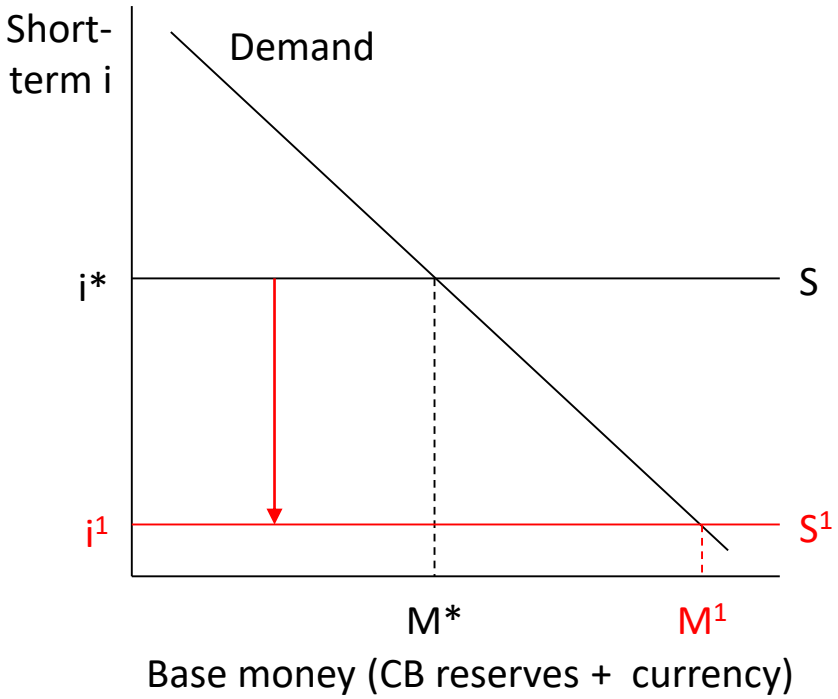
Figure 2: Change in the shape of the yield curve in the last 6 months of 2008

After Quantitative Easing began in 2009, the yield on longer-term bonds fell, which encouraged investment



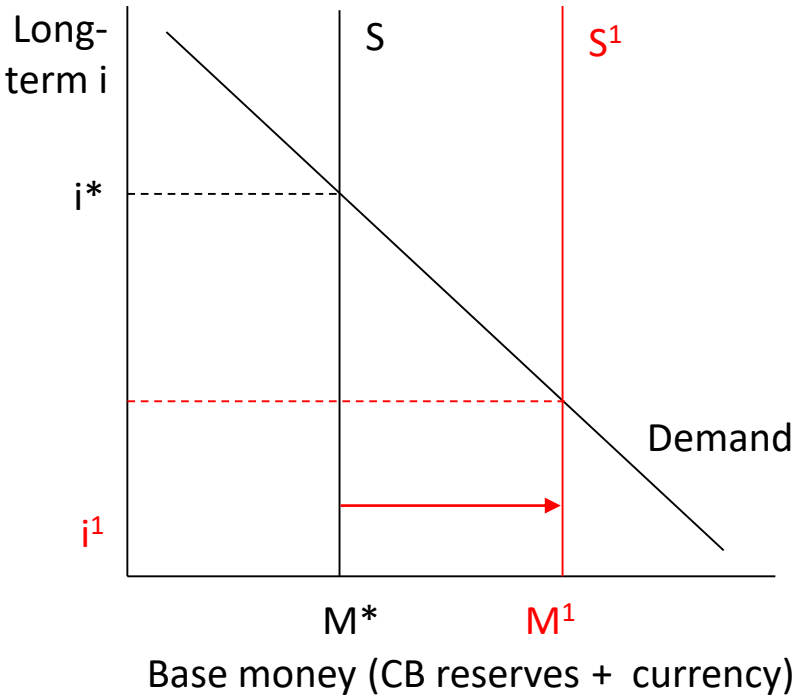
It is called "quantitative easing" because the central bank "eased" policy by increasing the "quantity" of money

UK conventional monetary policy during the global financial crisis



Conventional monetary policy announces a cash rate target

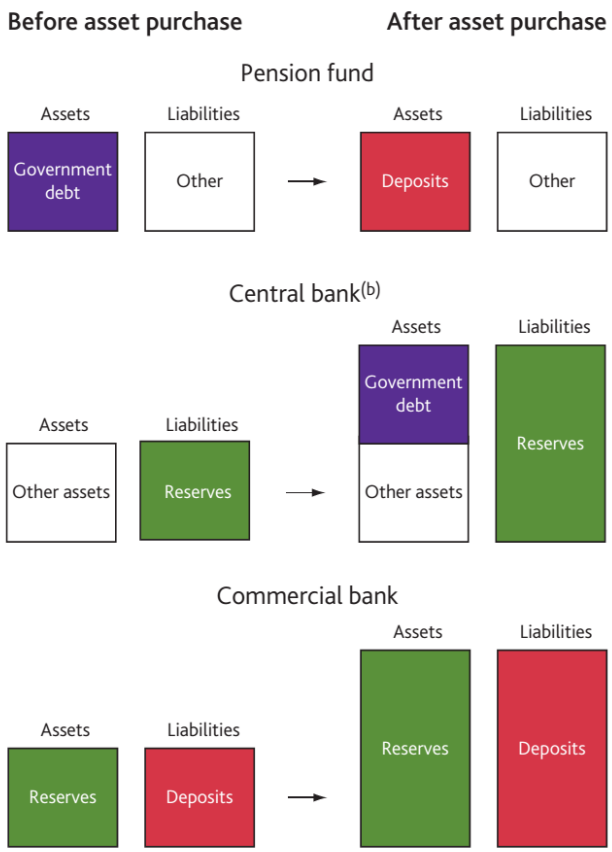
UK quantitative easing during the global financial crisis



Quantitative Easing announced a quantity target

How was this done? Conventional monetary policy uses reserves to buy government bonds from banks. QE used reserves to buy bonds from firms

Figure 3 Impact of QE on balance sheets[a]



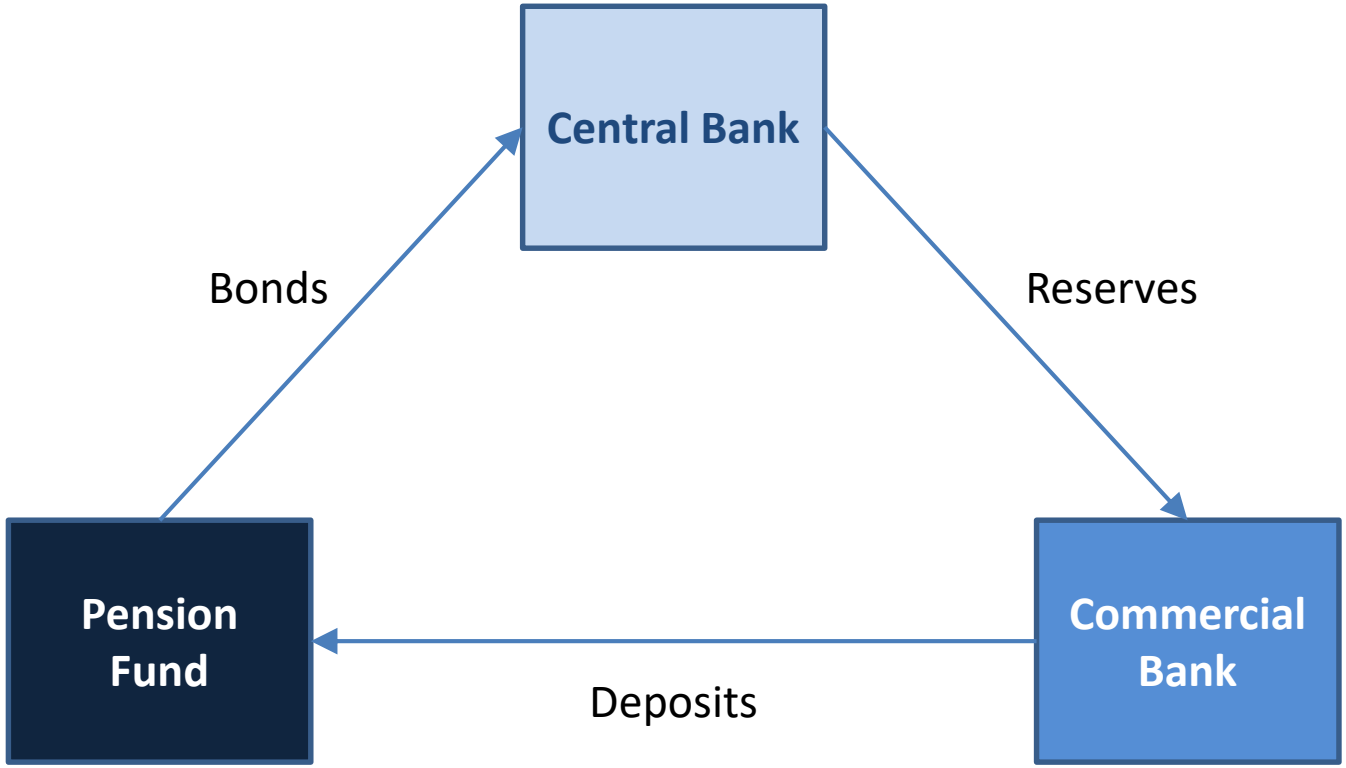
(a) Balance sheets are highly stylised for ease of exposition: quantities of assets and liabilities shown do not correspond to the quantities actually held by those sectors. The figure only shows assets and liabilities relevant to the transaction.
(b) Government debt is actually purchased by the Bank of England's Asset Purchase Facility using a loan from the Bank of England, so does not actually appear directly on the Bank's official consolidated balance sheet.

A pension fund starts with a gov't bond, which it sells to the CB…

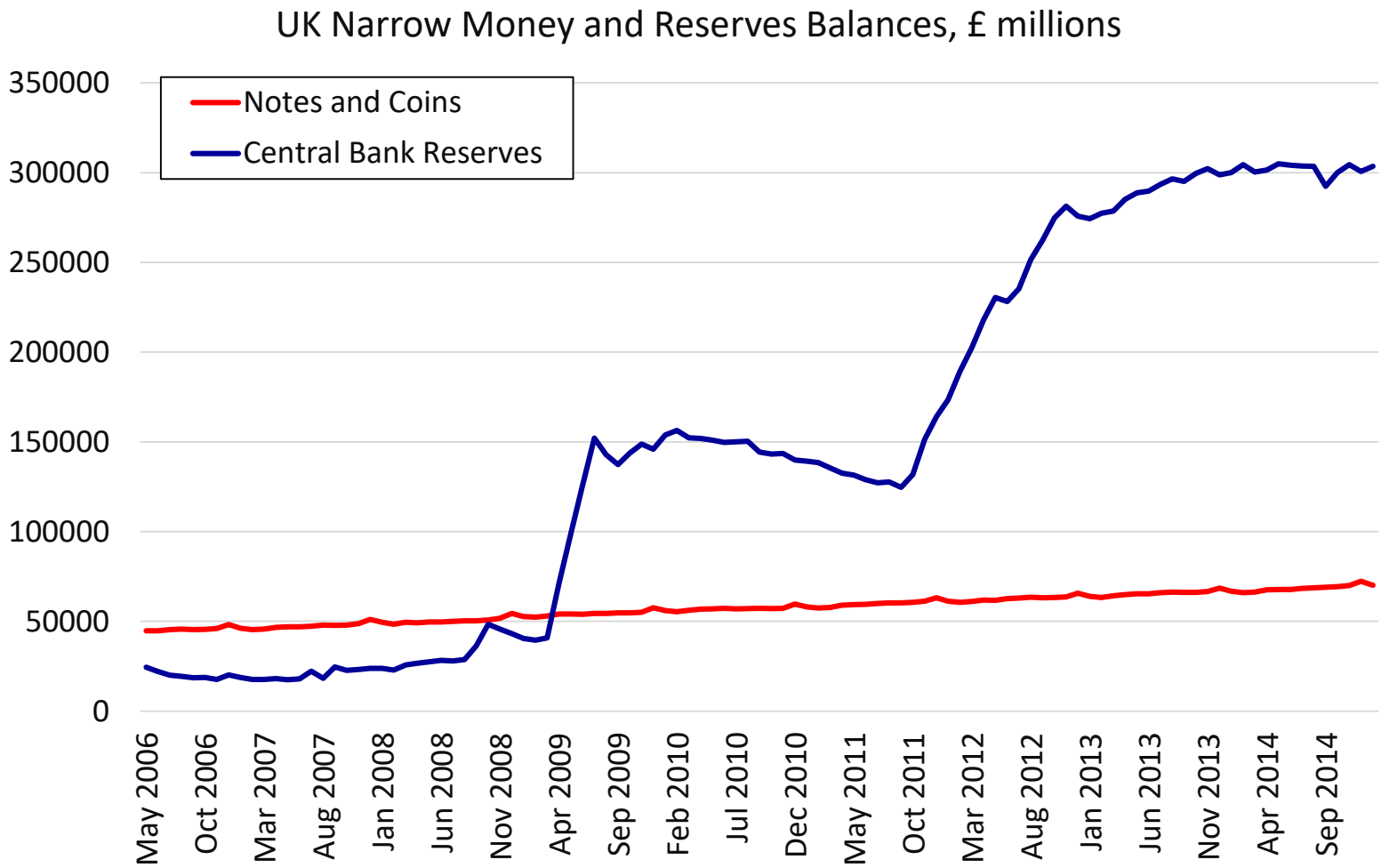
The CB pays for the bond with reserves (printing electronic money)

The reserves are given to the pension fund's bank, which increases the pension fund's deposits

So in QE the Central Bank gives more reserves to Commercial Banks, who hold more Pension Fund deposits, in exchange for selling bonds

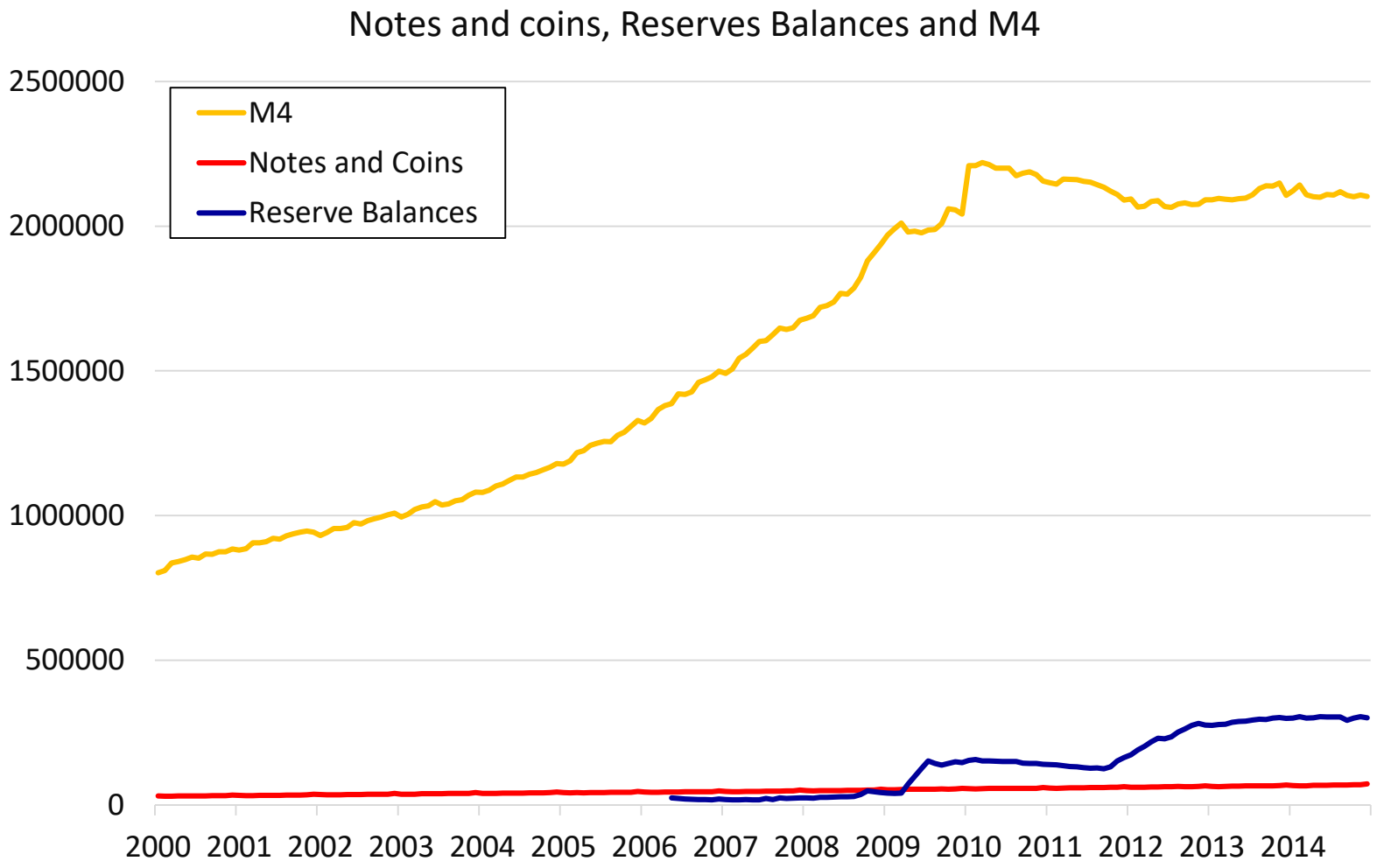


This can be clearly seen with the large increase in the UK's central bank reserves over the QE period



SOURCE: Bank of England, January 2015

Lower long-term interest rates made investing more attractive, so banks lent more, increasing broad money



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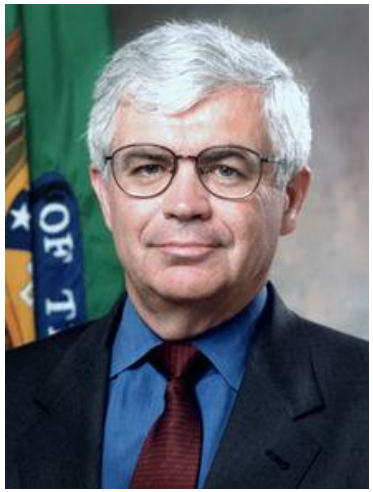
The central bank will respond to deviations of inflation and output from their equilibrium levels, which can be simply described by a Taylor rule



John Taylor (Stanford)

Warwick McKibbin (ANU)

The Taylor Rule

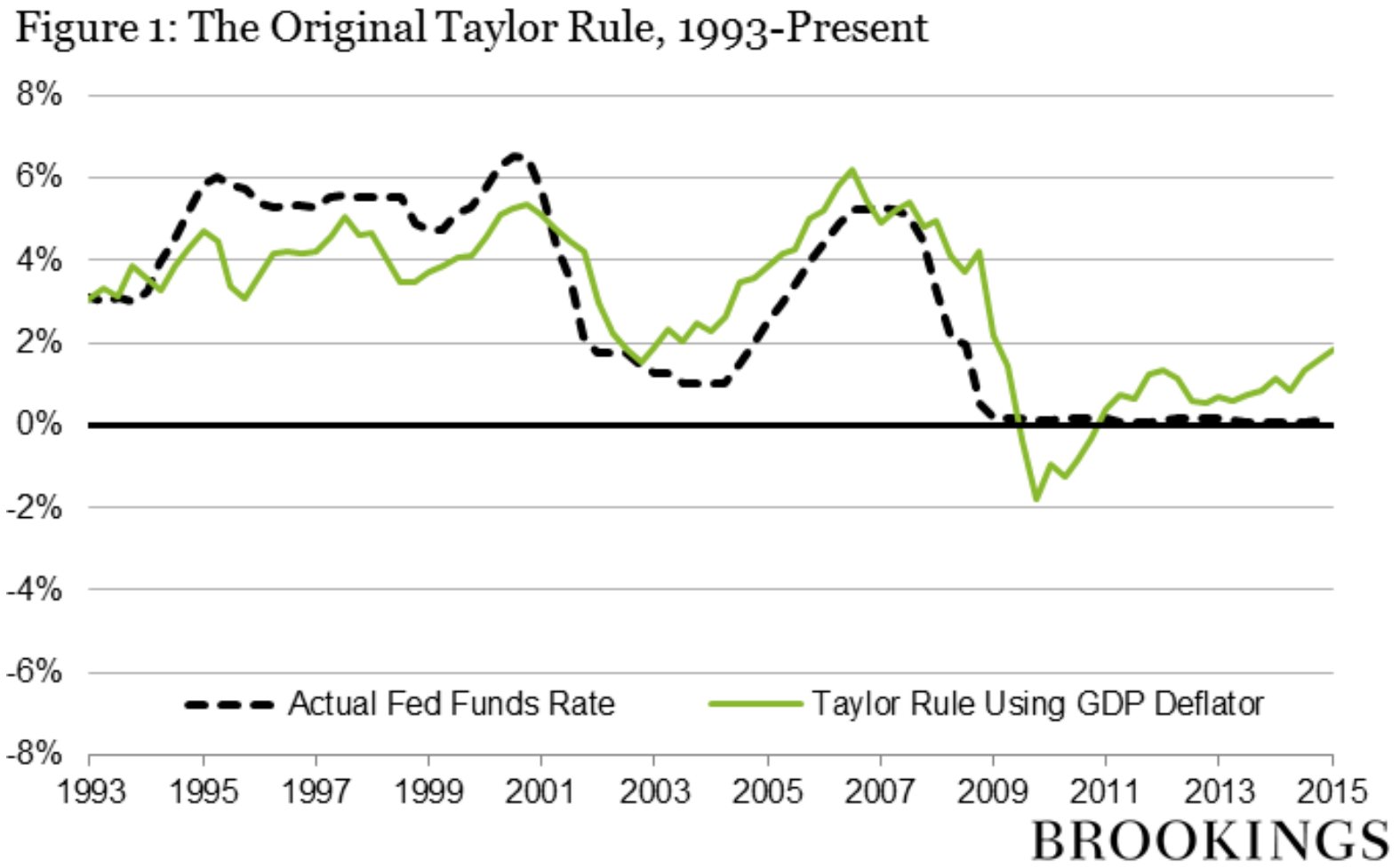
$$r_t = 0.01 + 0.5\left(\frac{y - y^*}{y^*}\right) + 0.5p$$

Real interest rate

Output gap

Inflation

It turns out this simple Taylor rule does a pretty good job of describing how the US Fed sets interest rates



Source: Brookings Institution

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When the Central Bank changes the nominal interest rate it also changes the real interest rate, which is what actually affects people's decisions

The Fisher Equation

$$i = r + \pi$$

Nominal interest rate *Real interest rate* *Inflation rate*

In the short run:

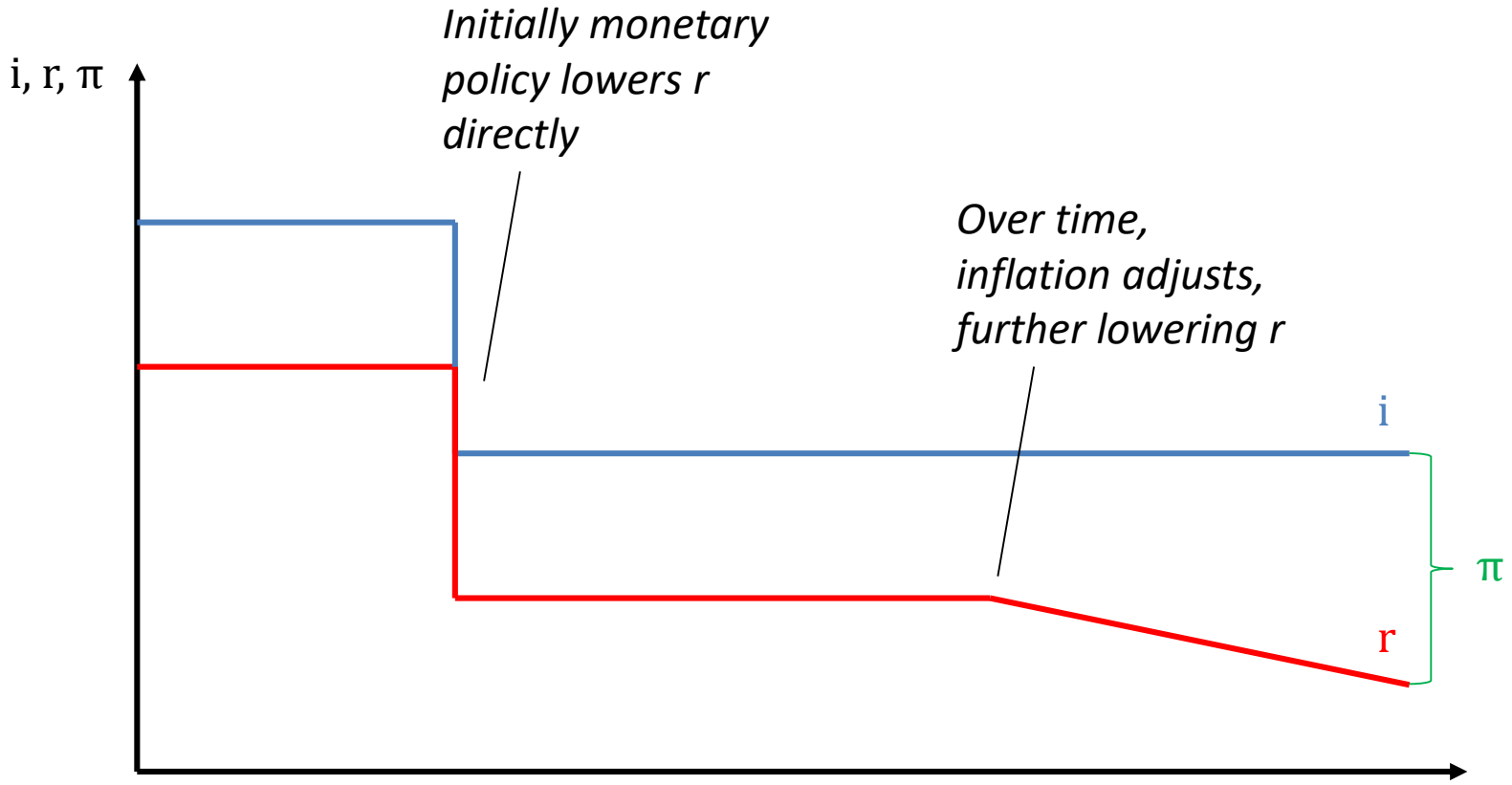
- It takes time for a change in i to feed through to π, so the initial effect is on r

In the medium run:

- Higher i will eventually lower π, so the effect on r gets larger over time

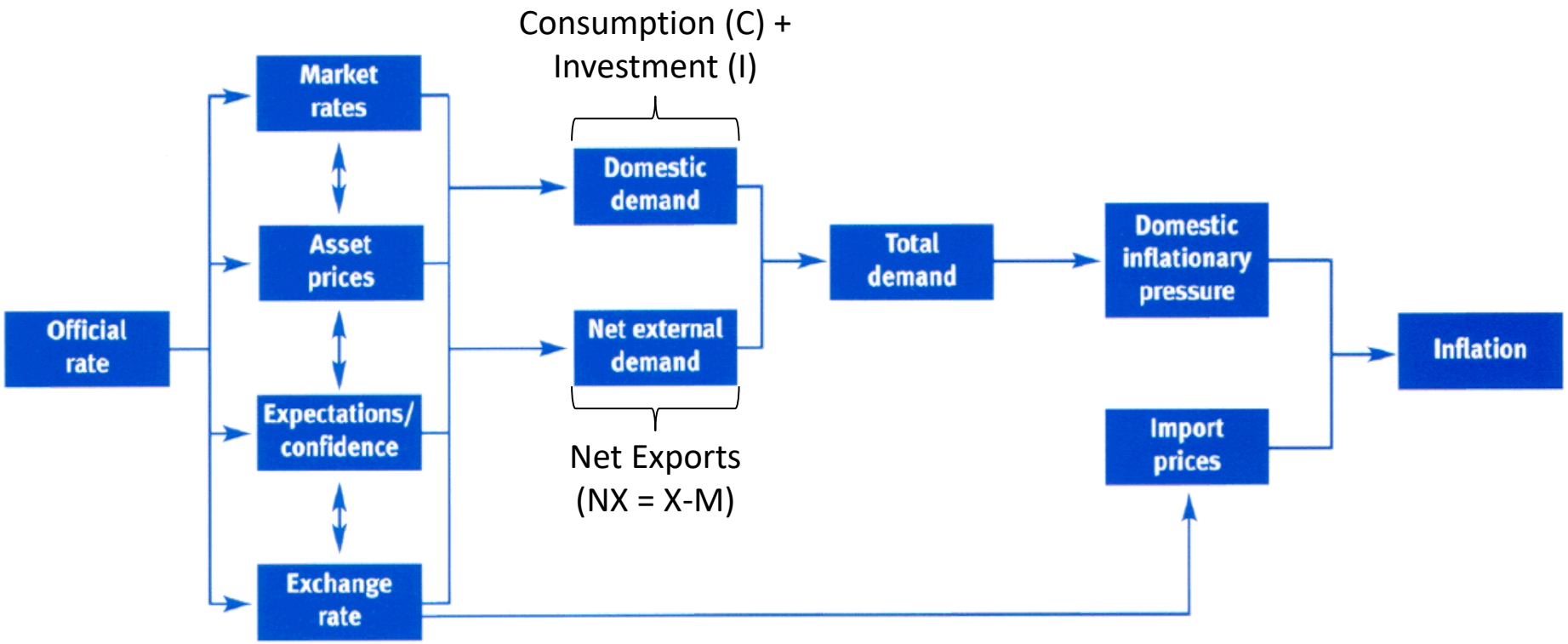
In the short run inflation expectations are sticky, so changing I just changes r. Over time inflation expectations change, further changing r

Example: loosening monetary policy



When the Central Bank changes interest rates it affects the economy through a variety of "transmission channels"

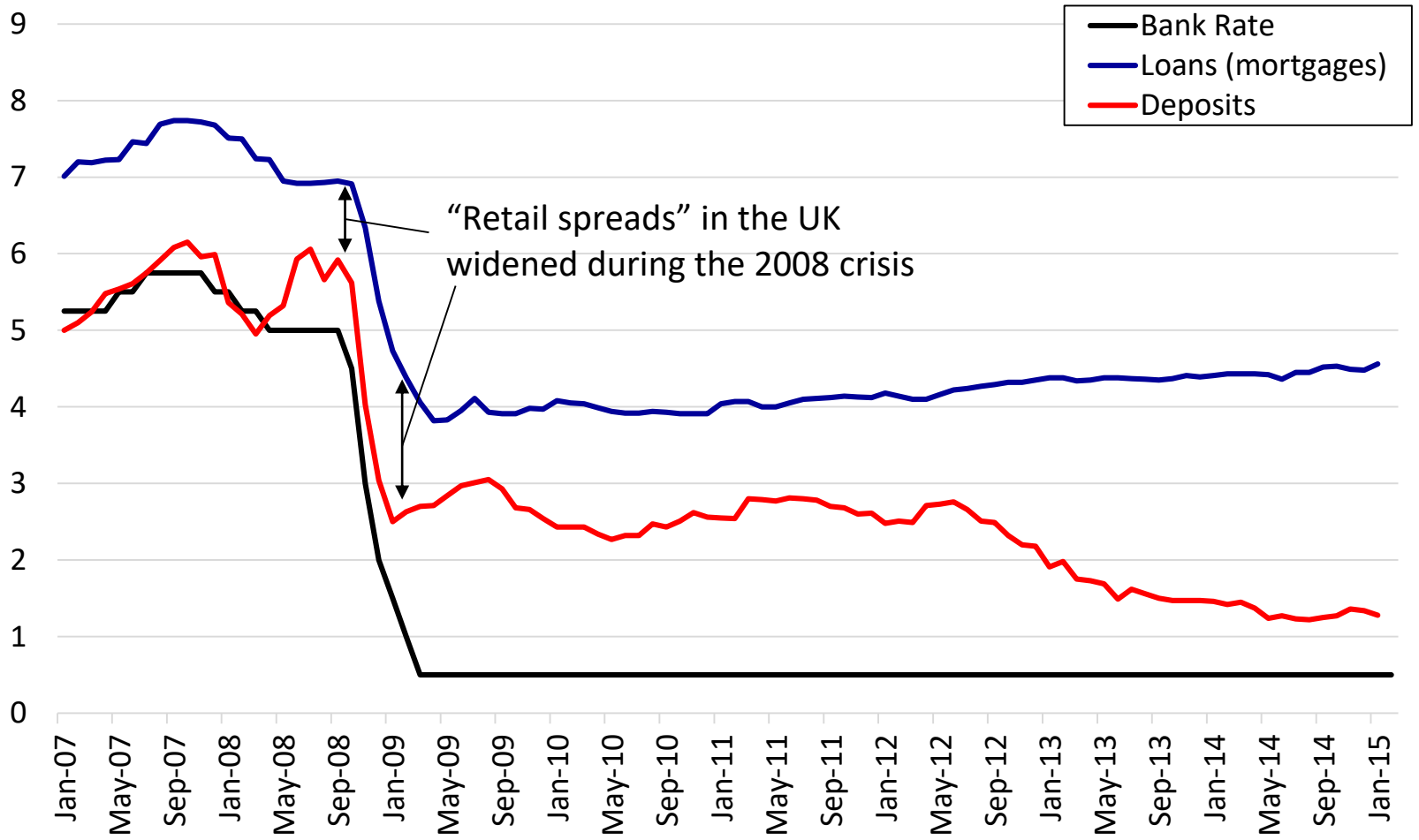
Transmission channels of monetary policy



Source: Bank of England

The Market Rate channel works through deposit rates (-> C) and loan rates (-> C and I), though in 2008 the pass-through wasn't perfect

Various UK interest rates, %



Source: Bank of England

In Australia saving has gone up despite low interest rates since the financial crisis, due to precautionary savings/rebuilding wealth

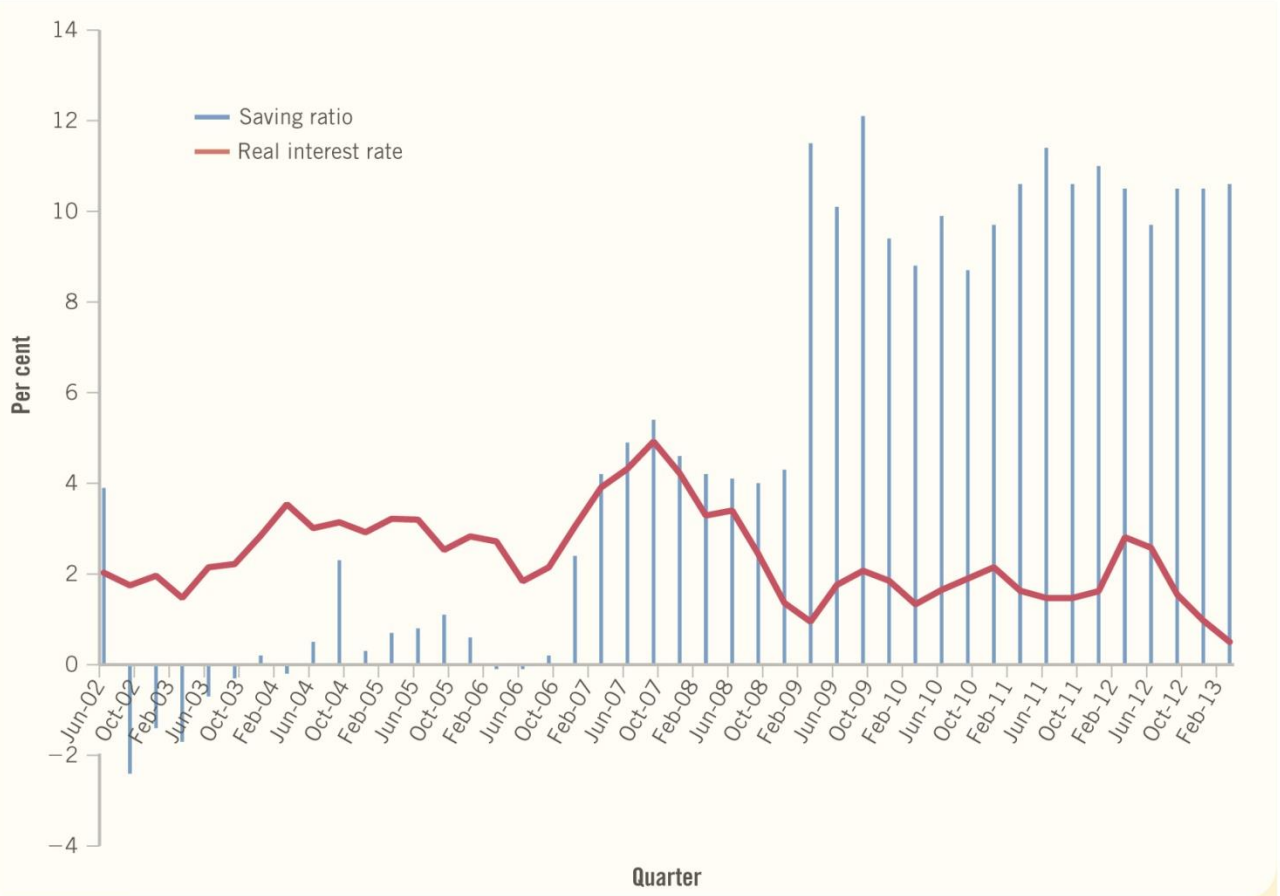


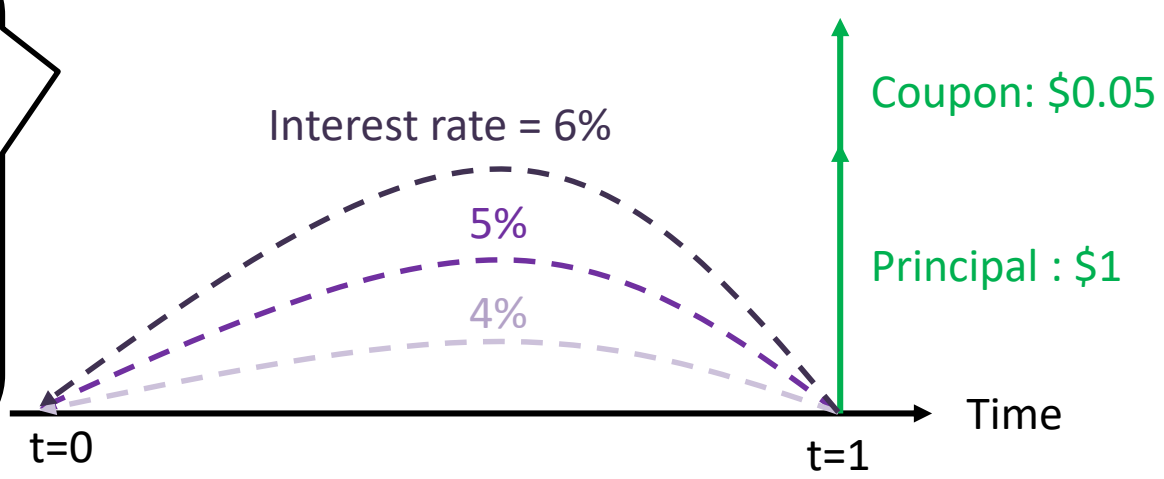
Figure 8.5 **The household saving ratio and the real interest rate** Despite a relatively low real interest rate, the household saving ratio in Australia has been relatively high since the global financial crisis.

Source: OECD *Economic Outlook*

The asset price channel works through the discount rate, which changes the value of future income, making asset owners richer or poorer

The price of a bond varies inversely with interest rates

When someone buys a bond they get a claim on future income. This is an asset. The value depends on the discount rate.



Bond price @6% = ($1 + $0.05) / (1.06) = $0.99
Bond price @5% = ($1 + $0.05) / (1.05) = $1
Bond price @4% = ($1 + $0.05) / (1.04) = $1.01

If the interest rate falls the value of bonds will rise.
Bond-owners are then richer, so will spend more (-> C)

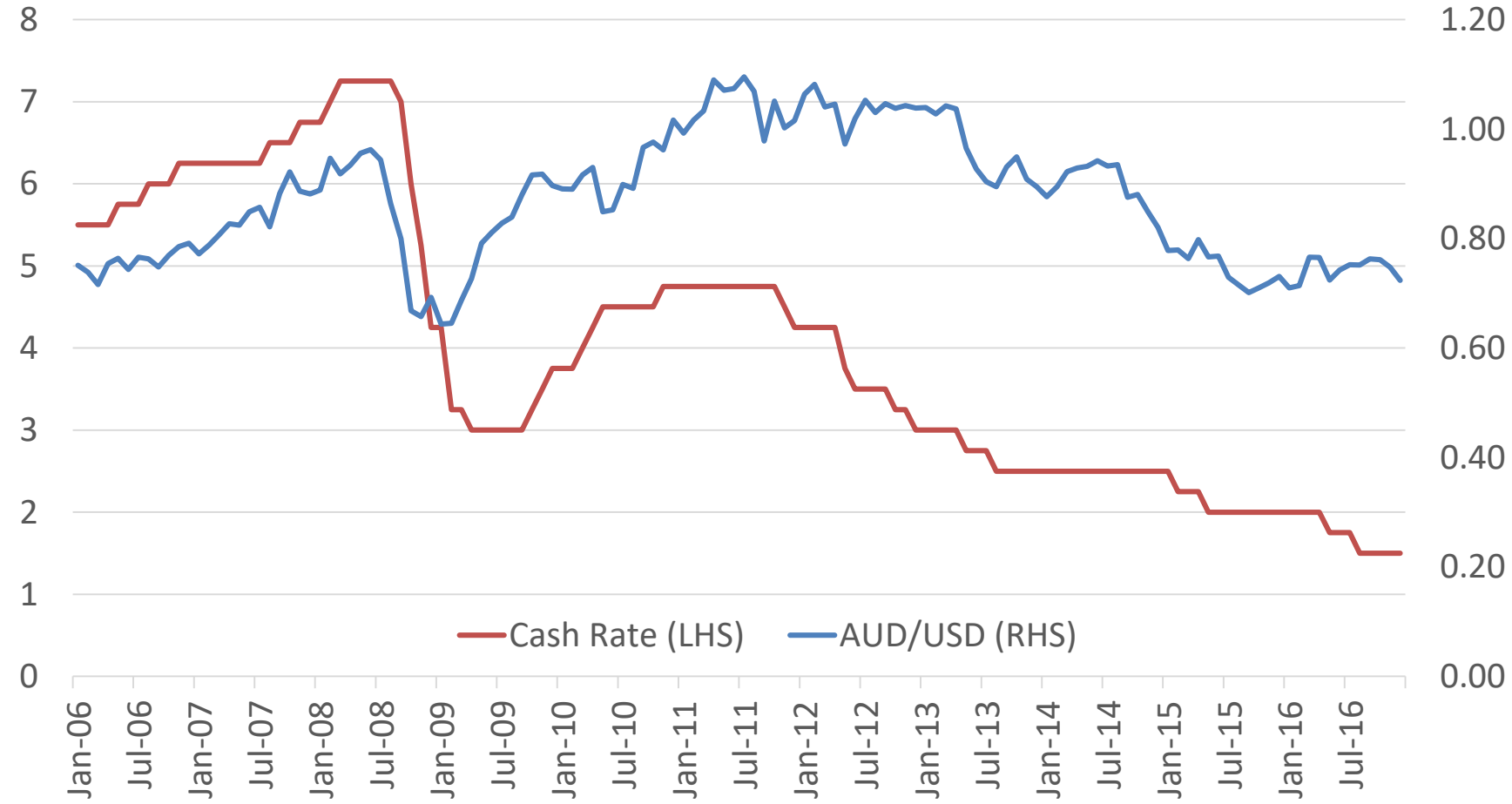
The expectations channel happens through "open mouth" operations, which influences how confident people are about the future (-> C and I)

Phillip Lowe, RBA Governor (2016-) conducting "open mouth operations"

"…at its recent meetings the Board judged that there were reasonable prospects for achieving sustainable growth in the economy with inflation returning to the medium-term target over time and, hence, it was appropriate to leave the cash rate at 1.50 per cent."

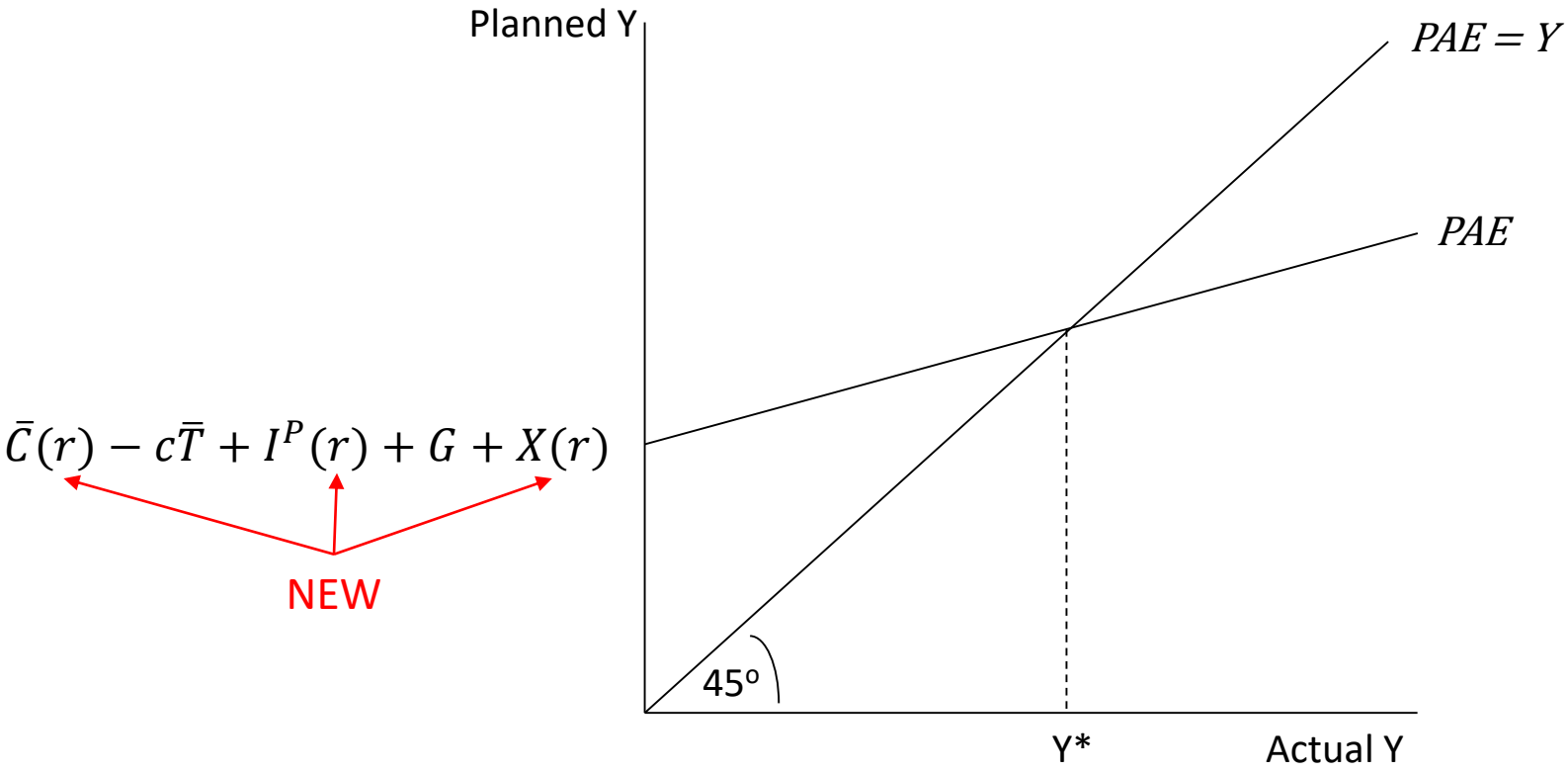
The exchange rate channel works because a lower i will depreciate the exchange rate, all else equal (which it usually isn't)

RBA cash rate (%) and AUD/USD exchange rate



Source: RBA

We can represent these effects on the Keynesian Cross by "endogenizing" C, I^P and X with respect to the real interest rate r

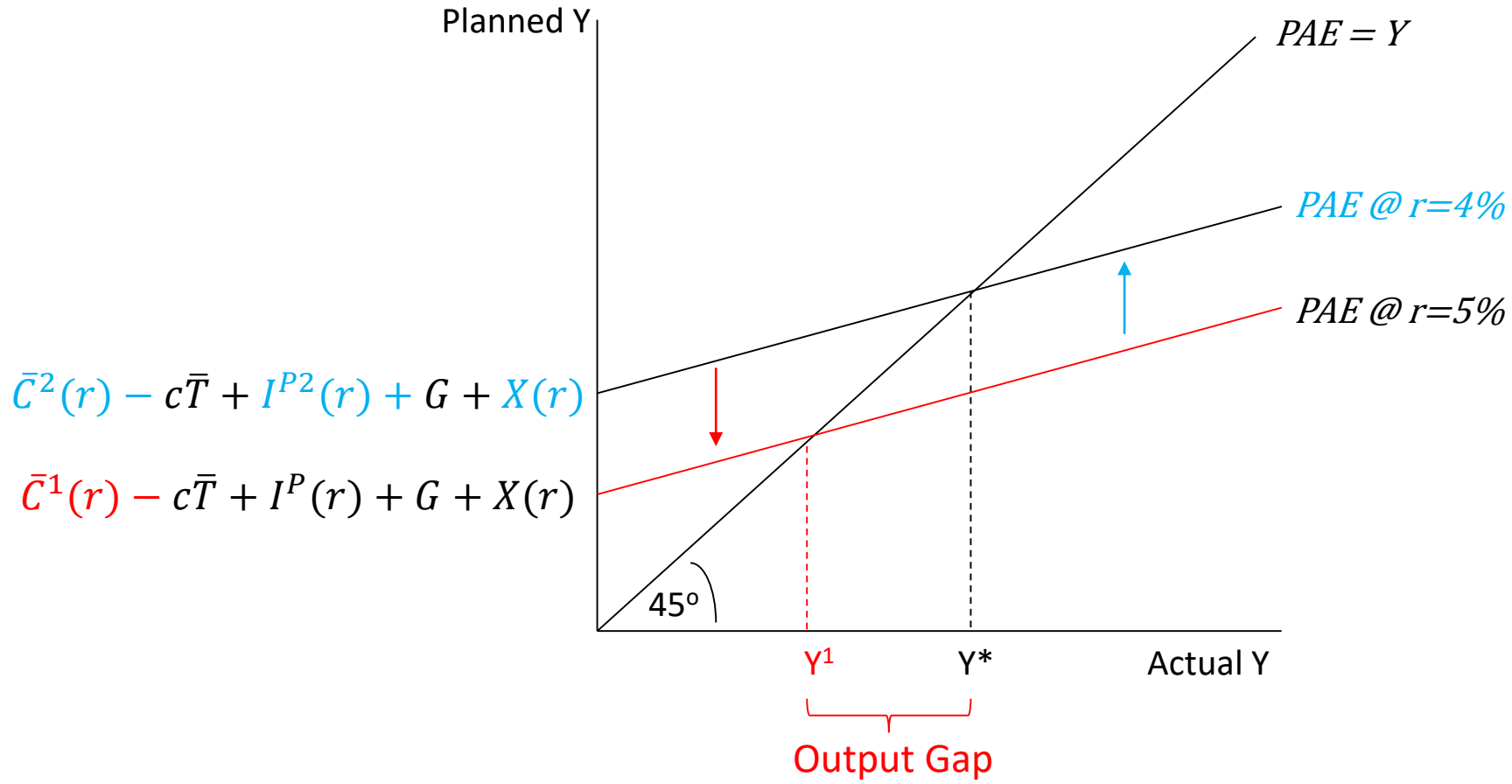


$C^d = \bar{C}(r) - c\bar{T} + c(1-t)Y$ where $\bar{C}(r) = \alpha_1 - \alpha_2 r$

$I^P = \bar{I} - \beta r$

$X = \bar{X} - \gamma r$

Together the four channels can correct a fall in aggregate demand, and be used to manage recessions



This is "Monetary Stimulus" during a recession.

Summary

- A well-functioning financial system improves the allocation of saving by providing information and risk sharing.
- A bond is a legal promise to repay a debt, usually including both the principal amount and regular interest, or coupon, payments.
- The Reserve Bank operates monetary policy by targeting the overnight cash interest rate.
- Open-market operations are used to keep the cash rate at its target.
- The target is moved by changing the interest paid on exchange settlement accounts.
- In the short run, the Reserve Bank controls both the real and nominal interest rates
- The Reserve Bank's actions affect the economy because changes in the real interest rate affect planned spending.
- A policy reaction function describes how the action a policy maker takes depends on the state of the economy.