

# Lecture 2

## Conventional monetary policy

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# Disclaimer

The views expressed in this presentation, and all errors and omissions, should be regarded as those solely of the author, and are not necessarily those of the Bank of England or Qatar Central Bank.

# A (recent) history lesson

# The old days

We once 'knew' how to operate monetary policy:

- Flexible inflation targeting
- Set the nominal 'short' interest rate by minor variations in the size of the (small) central bank balance sheet

Results were (apparently) desirable

- Low and stable inflation
- Reduced frequency/scale of recessions ('Great Moderation')

**What's not to like?**

*[W]e would be well-advised to put our money on the theory that our central bankers today are more skilled, more far-sighted, and less prone to either shortsightedly jerking themselves around or being jerked around by political masters who unpredictably change the objectives they are supposed to pursue year after year. Long may this state of affairs continue.*

- Brad De Long (2007)



I'm the king of the world. . .



# The old days are gone

- During (and after) the financial crisis, the 'short rate' could not be used
  - Zero lower bound (ZLB) prevented 'conventional' policy
- Unconventional monetary policy was introduced instead
  - Large scale asset purchases
  - Forward guidance
- Some of these tools still prevail and could become permanent
  - Setting the short rate now achieved in a different way
  - New tools possibly reduce constraining effect of ZLB
- Even the interpretation of 'price stability' has been questioned
  - 'Price level targeting' variants have been mooted



# Conventional monetary policy

Central banks (CBs) conventionally would use a 'short term interest rate' as their primary policy tool

- But what does that actually mean?

We answer this question from three perspectives:

- How it is implemented
- How it influences the economy
- How the 'appropriate' interest rate is chosen

# Implementation

CBs focus on *influencing* rates on short term riskless lending, typically between 'banks'

- Their influence comes via **affecting the supply of money** in these markets
  - Remember: CBs have a monopoly on money creation
- This affects the price at which banks lend and borrow money among each-other
  - That 'price' is the market **interest rate**
  - In the US, the market is for 'Federal funds' and the rate is the 'Federal funds rate'
- CBs try to align the market rate with a desired 'target' rate
  - The market rate is an 'intermediate' policy target or 'instrument' target
  - Contrast with inflation being the 'ultimate' policy target

Why do CBs want market rates to align with the target rate?

- If no market rates are aligned with it, then what is the influence of policy?
- How are people supposed to figure out the true policy stance?

If people and firms face rates that are divorced from what the CB thinks should prevail, then they aren't going to behave in the way the CB wants!

# Implementation

From the March 2006 FOMC meeting **statement**:

*The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to 4.75 percent.*

From the March 2006 FOMC meeting **minutes**:

*[T]he Committee voted to authorize and direct the Federal Reserve Bank of New York, until it was instructed otherwise, to execute transactions in the System Account in accordance with the following domestic policy directive: 'The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee in the immediate future seeks conditions in reserve markets consistent with increasing the federal funds rate to an average of around 4.75 percent.'*

*Anyone covering financial markets in 2007 and 2008 will recall how the market went from not caring very much at all about arcane goings on in money markets, to being totally obsessed.*

- Izabella Kaminska, [FT.com](#), December 13, 2021

# Implementation

A simplified CB balance sheet. . .

Assets	Liabilities
Securities (mainly domestic government bonds)	Coin & notes
Foreign reserves (large in emerging countries)	<b>Bank reserves</b>
Net lending to banks (part of OMO)	CB capital (typically kept small)

Both reserves and coin & notes are **CB money**

- Coin/notes evolve in line with trend growth of the economy
  - Side note: What about **CBDC**?
- Here we focus on *reserves* as the CB varies their supply to influence the policy rate

# Implementation

Banks hold reserve accounts with the CB

- Banks transact with each other by the CB crediting and debiting these accounts
  - Suppose Alice has an account at bank A and Bob has an account at Bank B
  - Alice pays Bob \$100 for a service using her account
  - Bank A debits Alice's account by \$100 and Bank B credits Bob's account by \$100
  - Central Bank debits Bank A's reserve account by \$100 and credits Bank B's by \$100
- Banks *value* reserves for their ability to settle transactions driven by (somewhat unpredictable) client flows
  - Also, regulators may require banks hold minimum balances
  - The Fed no longer has required reserves



# Implementation

Banks borrow/lend reserves among each-other (overnight)

- The 'price' for this is the **Federal Funds Rate** (in the US)
- Banks who need/want extra reserves will borrow and banks who are relatively flush will be lenders
- The lower (higher) the FFR the more (less) demand there will be for reserves

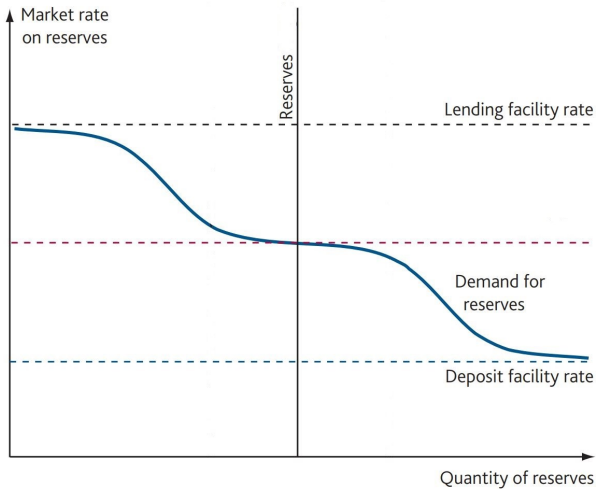
**But what rate will prevail?**

- We have demand, but what about supply?
- Rate will be that which equates demand and supply (clears the market)

**The central bank sets the total supply of reserves**

## The central bank sets the total supply of reserves

- If the total amount of reserves is 'large' then the rate banks can charge to lend will be 'low'
  - Few banks short of reserves so average bank will be trying to lend out
  - But the average has to be zero to clear markets
  - Rate has to fall to make them contented
- If the total amount of reserves is 'small' then the rate banks can charge to lend will be 'high'
  - Many banks short of reserves



Source: BoE, June (2015) [edited]

# Implementation

Banks' desire for reserves implies a market **demand curve**, decreasing in the 'price' of borrowing reserves overnight

- The interest rate is the 'price'

The location of the vertical **supply curve** would be set by CB to cut the **demand curve** at the targeted interest rate

- Location of the supply curve reflects total amount of reserves
- Markets clear where the supply curve cuts the demand curve

# Implementation

**Open market operations** add or remove reserves to/from the banking system

- All else equal, increases in reserves will lower rates (and vice versa)

For **'permanent'** changes: Use 'outright purchases' (or sales) of securities from banks

- These will typically (in US) be linked to the medium term stance of policy
- For a purchase (sale) CB credits (debits) the bank's reserve account

For **'temporary'** changes: Use **repurchase (repo) and reverse repurchase (reverse repo) agreements**

- Typically used (in US) to offset intra-day or other high frequency changes in reserve demand

# Implementation

Simple way to look at OMOs:

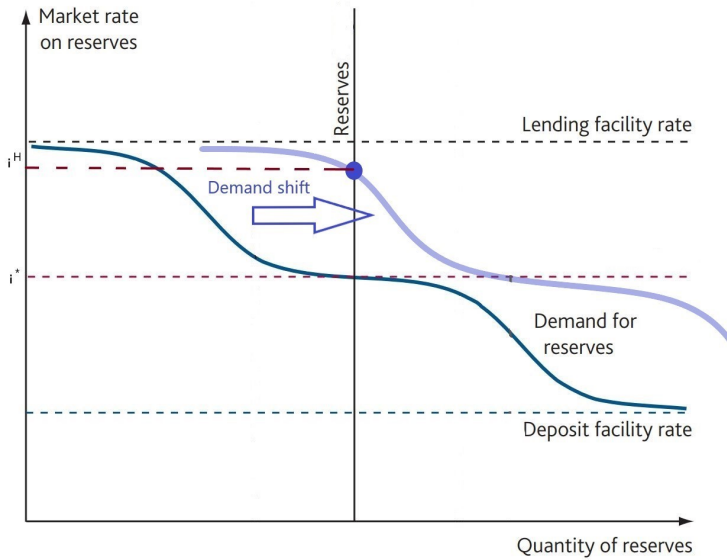
- If the CB buys securities it is taking them out of the system and injecting money (reserves)
- If the CB sells securities it is restoring them to the system and draining money (reserves)

Outright operations and repos/r-repos differ simply in how long the changes are allowed to persist *for a given transaction*

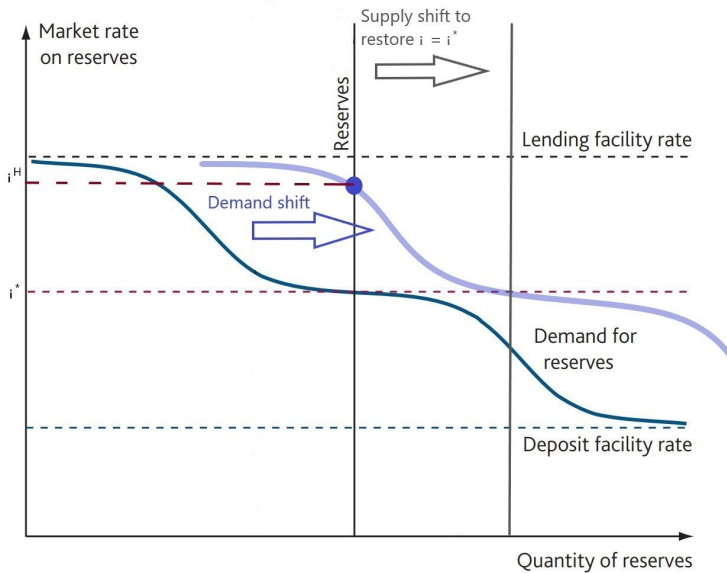
▶ OMO Detail

Question(s): Suppose, *all else equal*, banks suddenly (and temporarily) want more reserves

- What might be the cause of this?
- What does that look like in our diagram?
- What is the effect on the amount of reserves?
- What is the effect on the target rate?
- What is the effect on the market rate?
- How should the CB respond?

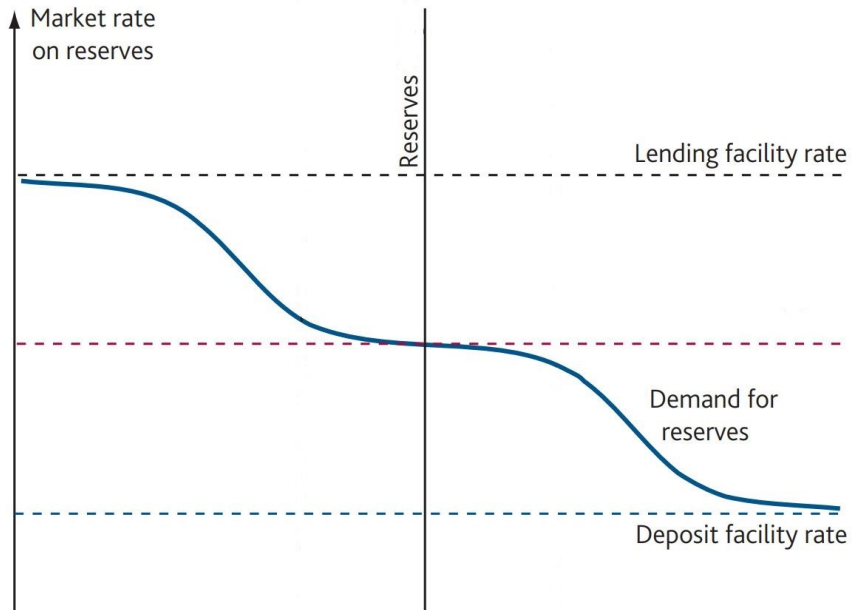






# Implementation

At this point, were this a course purely on **conventional** monetary policy, we could probably stop discussing this topic **BUT** we will comment on the 'lending' and 'deposit' rates in our diagram, as they (or the deposit rate, at least) are useful in understanding **unconventional** policy...



# Implementation

**'Corridor'** systems were typically implemented to ensure that **market** rates would align with the **target** rates the CB wanted:

- Market rates bracketed by rates offered by the CB
  - **Top:** 'Lending rate' if banks borrow reserves from CB
  - **Bottom:** 'Deposit rate' if banks leave reserves at CB

These facilities limit (but with a wide margin of error) the rates that can prevail in interbank markets

- No one will lend at rates below that offered by the CB  
**this should put a 'floor' on rates**
- No one will borrow at rates above that offered by the CB  
**this should put a 'ceiling' on rates**

Do note, though, that in the US, the 'floor' was at zero (interest was traditionally not paid on reserves)

# Implementation

Corridor limits variation in market rates *to some degree*

- In addition, OMOs are constantly used by CBs to **further** reduce variation in rates around target
- (*Technical:*) In fact the corridor can help make the OMOs more effective by influencing the shape of the demand curve - making it flatter around the desired interest rate value

Additional *financial stability* role for these facilities (which we won't discuss):

- Escape valve for banks who have mismanaged their liquidity
- In particular, the lending rate allows banks to smooth out (hopefully) temporary liquidity shortages

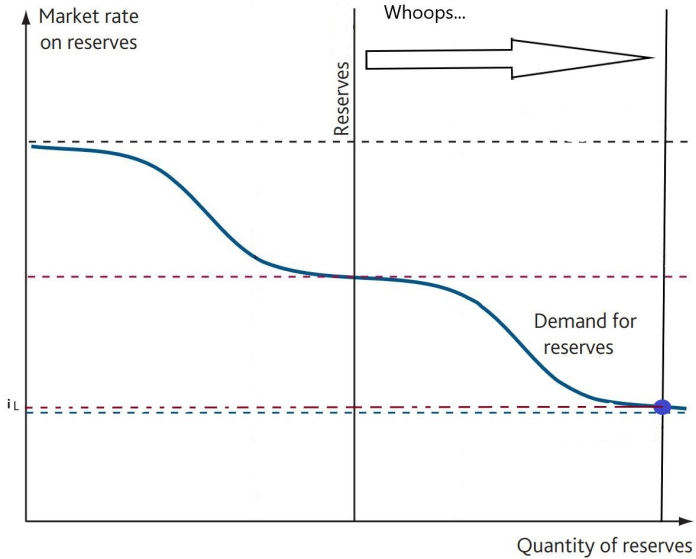
# Implementation

Summing up the discussion of 'implementation' details:

- Announced policy rate doesn't 'magically' become the rate at which private sector transacts
- Central banks use various tools (corridor and OMOs) to coax market rate to the desired value
- A corridor system features a 'floor' below the target policy rate

Question(s):

- What would happen if, one morning, by mistake, the CB trading desk flooded a corridor system with reserves, because of a 'fat finger' typo?



But why is the overnight rate on lending between banks so important?

- Hardly anyone has access to the market (it's just 'banks')
- It's for one (very short) maturity and on a particular type of lending (riskless)

By anchoring this particular rate **and** explaining how it may be set **in the future**, the CB can influence many **other** rates

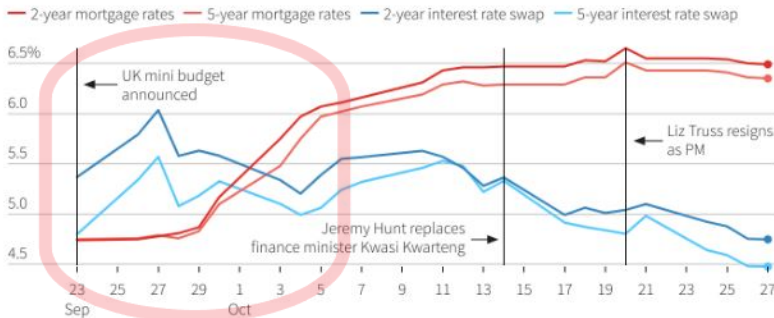
- And this influences firms, households, governments. . .
- This is called the '*transmission mechanism*'



*Example 1:* Suppose a bank is considering making a riskless loan with a maturity of several months

- It has the **alternative** of lending that money in the FF market
  - Can earn the FFR on overnight lending and can roll over that lending, day after day
- When considering the loan, or how to *price* the loan, the bank must consider **not only** what the FFR is **now** but **what it might be over the life of the loan**
  - If the FFR is expected to be high over life of loan, the bank will only be willing to lend to the borrower at a high rate
  - Indeed, the FFR may not be **currently** high, but if it is **expected to rise**, the bank may still be reluctant to lend to the borrower, except at a high rate

Alternatively, think of the **Liz Truss debacle** in the UK, and the effect on mortgages of changes in banks' expectations of future rates. . .



Dramatic mortgage movements in recent months (UK). Source: [Data from Moneyfacts, Refinitiv Eikon, Reuters - October 27 2022](#)

- Blue lines (loosely) capture the expected path of the short rate
- Red lines are (long) mortgage rates

# 40% of mortgage deals pulled since mini-budget; financial markets in turmoil - as it happened

**Prime minister and Treasury secretary fail to restore investor confidence in series of interviews, as government bond yields rise and stock markets tumble**

Dramatic mortgage movements in recent months (UK). Source: [Guardian online - September 29 2022](#)

*Example 2:* Suppose a bank is considering making a risky overnight loan, in the sense that **there is a (small) probability  $p$  of the loan defaulting completely**

- It has the **alternative** of lending that money in the FF market
  - Can earn the FFR on overnight lending without any risk
- When considering the loan, the bank must consider what rate to apply to the loan
  - For the bank to make the loan, the rate should approximately be the FFR **plus  $p$**

Now, if the Fed raises the target FFR and the actual FFR moves in line, then rates on **risky** lending should move with it

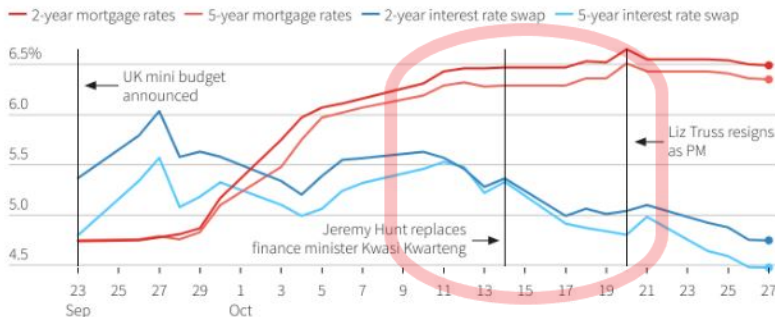
Although the CB only directly influences a **riskless short** rate, its actions and expected future actions *indirectly* influence **long** rates and rates on **risky** lending

- The CB connects with the economy through short term riskless rates
- But its influence ripples through many other markets

We have only touched on a couple of examples, focusing on bank lending, but households and firms, and a broader array of asset prices and markets all are influenced by *what the CB does* and *what they are expected to do*

Before we move off this segment, let us note that default risk is not the only risk influencing banks' lending decisions

- Uncertainty about the path of central bank policy may also lead to other, longer maturity, rates being affected
- Again, let us return to the recent UK experience...



Persistent premium in mortgage rates (UK). Source: [Data from Moneyfacts, Refinitiv Eikon, Reuters - October 27 2022](#)

- Recall, the blue lines (loosely) capture expected path of the short rate
- A persistent 'risk' premium emerged in mortgage rates (red lines) and other long maturity interest rates

# What rate?

So far we've discussed **how** policy rates are set but now we ask at what level **should** the policy rate be set?

- The FOMC doesn't (or didn't use to) spend much time thinking about reserve supply
- They focus on whether they should be tightening policy (raising the target rate), loosening (lowering the target rate) or leaving things unchanged
- Implicitly, they assume the NY Fed will do 'what needs to be done' for this rate to prevail in the FF market



# What rate?

What influences the decision over the target rate?

- Central banks are concerned with achieving **price stability** while minimizing **volatility in real activity** (output, unemployment)
  - High and variable inflation distorts decisions, can raise costs of transactions, increase uncertainty, and redistribute wealth in unpredictable and socially disruptive ways
  - Volatile output and employment ('booms and busts') cause harmful uncertainty and, especially for the most vulnerable, severe hardship
- It is broadly accepted that higher (lower) policy rates, all else equal, will lower (raise) inflation **and** reduce (stimulate) output

# What rate?

Central banks aim for low and stable inflation and, where possible, try to cool the economy when output is too high or stimulate it when it was too low

- For several decades, many central banks have pursued 'inflation targets' (often denoted  $\pi^*$ )
- They also pay attention to a (noisy) measure of real 'slack', such as output relative to 'trend' (often denoted  $\tilde{y}_t$  and referred to as an 'output gap')

Prior to the GFC and Great Recession, there appeared to have been substantial success under this framework, leading people to refer to a 'Great Moderation'

# What rate?

Sometimes policy is **'easy'** such as when inflation and output are both being pushed in the **same** direction

- For example, a massive fiscal stimulus will typically boost growth above trend **and** inflation above target (see the US in recent times)
- We call these phenomena 'demand shocks' and the appropriate policy action is clear
- In that context, one would expect the CB to raise rates sharply
- A rate rise ('tightening' policy) should push inflation down to target **and** push output down to trend
- Both of which are desirable (there is no trade-off)

# What rate?

But sometimes policy is '**difficult**' such as when factors push inflation and activity in **opposite** directions

- Something hits the economy that makes it more difficult to produce enough to satisfy demand at given prices
- So a general increase in prices is needed to choke off demand, while the level of production contracts
- Such phenomena are referred to as 'negative supply shocks' (see the UK and Europe at the moment)
- What's the CB to do? **Raise** rates to control inflation or **cut** rates to support activity?

A '**flexible inflation targeter**' will tighten as slowly as they can, without risking their reputation for keeping inflation under control in the medium to long run

# What rate?

In the real world, the correct or 'optimal' policy is incredibly complex and may be unknowable!

- **But** can be closely *approximated* (some of the time)

Classic example is the famous Taylor (1993) analysis - leading to the 'Taylor Rule'

- See nice discussions of different rules [here](#) and [here](#)

A Taylor rule...

$$i_t = r^* + \pi_t + \zeta^\pi \times (\pi_t - \pi^*) + \zeta^y \times \tilde{y}_t$$

Importantly,  $\zeta^\pi$  (which Taylor '93 has as 0.5) 'should' be **positive**

# What rate?

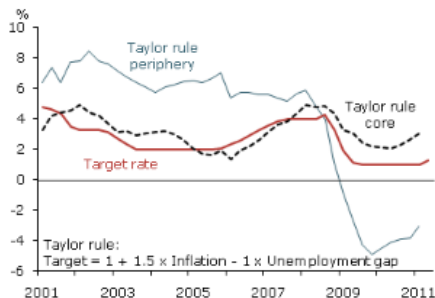
There is the interesting question of whether a policy rate set by the US is appropriate for small economies pegged to the Dollar

- Similarly, in a currency union, the rate set by the CB will rarely be appropriate for *all* regions
- Adopting a single currency = extreme case of a currency peg
- See the concept of an 'optimal currency area'

A nice piece of work (by an old colleague) showed how the ECB's rates may not be suitable for all the Eurozone countries

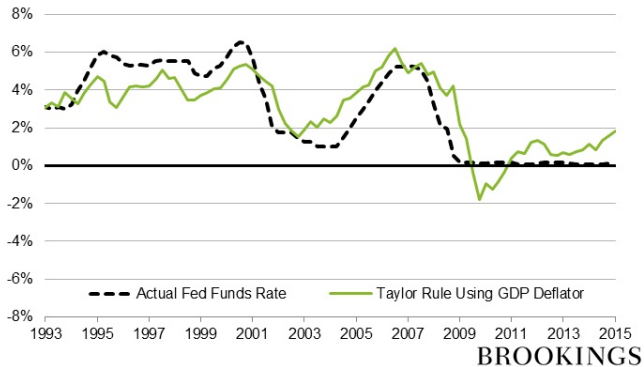
- The paper (or note) is 'Monetary policy when one size does not fit all'
- A Taylor rule was fitted to data from 'core' and 'periphery' Eurozone countries to give some sense of what policy an independent central banks, focused on the core or periphery, would set
- The rates were then compared to what the ECB actually set

# What rate?



## Takeaways:

- ECB rate not too far from that predicted for the core
- But very far from that predicted for the periphery



Original specification of rule (Taylor '93) extended beyond 1993



# What rate?

Perhaps it shouldn't be surprising that a simple rule fits (fairly) well, including out of sample

- The Fed is quite systematic and has a dual mandate (price stability and maximum employment)
- Tradeoff between price stability and excess real volatility (reflecting 'supply shocks') is captured in the presence of output gap ( $\tilde{y}$ ) term
  - Fed only *explicitly* adopted an inflation target in 2012

We will discuss later the interpretation of deviations from the rule - especially in the early 00s and after the GFC

# Appendix

## *Example 1: Outright purchase*

- Banks hold Gilts/Treasuries (a sovereign bond, typically)
- CB buys them - crediting (newly created) reserves to the account of the bank, in exchange
- Gilts are now owned by the CB and there is no 'automatic' reversal of the position
- Both sides of the CB balance sheet increase
- Increases the supply of reserves to where it cuts the demand curve at a rate near the policy rate

Note the importance of the CB's monopoly right to supply money 'out of thin air' (or 'with a tap of the keyboard')

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## Example 2: Repurchase agreement (repo)

- Banks hold Gilts/Treasuries (a sovereign bond, typically)
- Bank sells them to the CB *with the agreement to repurchase them at a given price after  $k$  days*
- As in the outright purchase case, the CB credits (newly created) reserves to the account of the bank *at the start of the 'repo'*, and acquires the Gilt in exchange
- The operation will be 'automatically' reversed in  $k$  days' time (so change in size of balance sheet / supply of reserves is temporary)
- Suitable for offsetting shorter term fluctuations in reserve demand - to keep cutting the demand curve at a rate near the policy rate

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