

Introductory Macroeconomics

Lecture 10: monetary policy

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This Lecture

- Monetary policy
 - basic monetary policy concepts
 - monetary policy transmission mechanism
 - coronavirus pandemic policy
- BOFAH chapter 10
- Philip Lowe: The Recovery, Investment and Monetary Policy

Basic Monetary Policy Concepts

Basic Monetary Policy Concepts

- Monetary authority (e.g., central bank) decisions to change *monetary instruments* such as
 - short-term nominal interest rates
 - narrow measures of the money supply
 - exchange rates (e.g., fixed vs. floating)
- In most countries, underlying *goals* of monetary policy usually include some combination of
 - price stability
 - full employment
 - financial stability

Monetary Policy in Australia

- Reserve Bank of Australia (RBA), our central bank
- Legislative objectives of monetary policy in *Reserve Bank Act 1959*
 - (1) ‘stability of the currency’
 - (2) ‘maintenance of full employment’
 - (3) ‘economic prosperity and welfare of the people of Australia’
- Current interpretations of these legislative goals
 - (1) low and stable inflation
 - (2) unemployment at the natural rate
 - (3) broadly stable macro environment, including financial stability

Inflation Target

- Since early 1990s, ‘low and stable inflation’ operationalised as an explicit *inflation target*
- *Statement on Conduct of Monetary Policy* between Treasurer and RBA Governor sets out this target
 - ‘inflation rate of 2-3 percent on average over time’

inflation

percentage growth rate
in the CPI

- Key points
 - low average *level* of inflation
 - allows for *variation* over time

(temporarily below 2% or above 3% in response to unusual shocks)

Reasons for Inflation Target

- Economic reasons:
 - average inflation low enough not to significantly *distort decisions*
 - provides ‘anchor’ for *inflation expectations*
 - Institutional reasons:
 - *(transparency)* and *(accountability)*
 - in particular, provides criterion against which to evaluate monetary policy success or failure
- high inflation → economic distortion → inefficiency misallocation
general rise
or some type of goods
rise*

Natural Rate Hypothesis

$u_t < u_t^*$ inflation ↑
↓
ultimately
 u_t (but → u_t^*)
 u_t revert to u_t^*
but still high inflation

- Why interpret ‘maintenance of full employment’ as ‘unemployment at the natural rate’?
- Theory behind this is known as the *natural rate hypothesis*, due to Friedman (1968) and Phelps (1968)
- Basic idea is that attempts to push actual unemployment u_t far below natural rate u_t^* simply *end up increasing inflation* without further reducing unemployment
- In other words, threatens the inflation target without delivering a sustained reduction in actual unemployment

Monetary Neutrality and Non-Neutrality

trend development
vs
cyclical development



- Idea behind the natural rate hypothesis is that monetary stimulus is neutral in the ‘long run’ but non-neutral in the ‘short run’
- Neutrality here refers to effects on *real* variables (real GDP, real interest rate, etc)
- So idea here is that in the ‘long run’ monetary stimulus increases inflation and increases nominal GDP, but has no effect on real GDP
- But in the ‘short run’ monetary stimulus increases inflation, increases nominal GDP *and* increases real GDP
- ⚡ Should not expect to generate permanent increase in living standards by changing the amount of money in circulation
- A very old idea, goes back to philosophers like Hume

Monetary Neutrality and Non-Neutrality

- Term ‘neutrality’ is used because if all prices increase by the same proportion, π say, then *relative prices* remain unchanged

$$\frac{(1 + \pi)p_1}{(1 + \pi)p_2} = \frac{p_1}{p_2}$$

- Adding or subtracting 000s to prices has no effect on what is actually *scarce* and what is *abundant* \Rightarrow doesn't affect real economy decision

Back to the Natural Rate Hypothesis

$$\text{Okun's law} \rightarrow \frac{Y_t - Y_t^*}{Y_t^*} = -\beta (u_t - u_t^*)$$

output gap $\frac{Y_t - Y_t^*}{Y_t^*}$ $= -\beta (u_t - u_t^*)$
 unemployment gap

- Recall from Lecture 5 that natural rate of unemployment u_t^* is the amount of unemployment when real GDP at potential Y_t^*
- In these terms, long run monetary neutrality then means we should not expect monetary policy to affect Y_t^* or u_t^*
 Y_t^, u_t^* independent of monetary policy
in the long run*
- But short run non neutrality means that we should expect monetary policy to change output gap and cyclical unemployment
 $Y_t - Y_t^$ $u_t - u_t^*$*
- Makes estimating u_t^* one of the most controversial topics in macro

Monetary Policy and Demand Management

- In other words, should not expect monetary policy to change long-run supply-side *trend* in economic activity
for potential output
- But should expect monetary policy to be useful in managing short-run demand-driven *cyclical* fluctuations in economic activity
- When there is a shortfall in demand for some reason, interest rates can be cut to stimulate consumption and investment demand
discourage saving ↑ borrow has low cost
- Both monetary and fiscal policy can be used to manage demand
 - monetary policy more nimble, can change interest rates overnight
 - fiscal policy more powerful, more direct, but slower
- Fiscal policy comes more to the fore in deep recessions

*short term interest rate less effective
indirectly affect interest rate
actually relevant to economic decision*

Monetary Policy Implementation

Monetary Policy Implementation

borrowing and lending between banks



- RBA targets the **cash rate**, the interest rate in *overnight* unsecured (no collateral) interbank market

抵押品

held in RBA

- Banks have Exchange Settlement Accounts (ESAs) to manage daily transactions
- ESA balances are essentially equivalent to *cash*
- Banks and other financial institutions credit and debit ESAs to settle payment obligations (via the Reserve Bank Information and Transfer System, RITS)

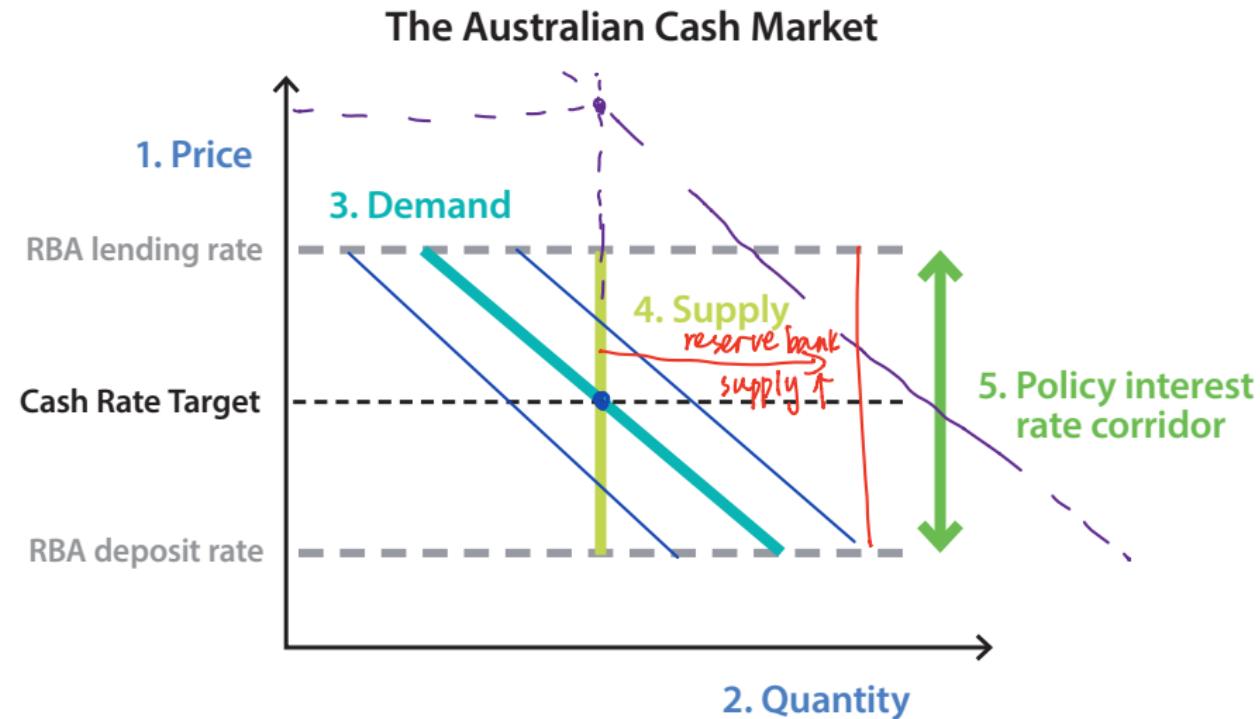
some banks borrow , some banks lend since excess reserve

rate of borrowing and lending → cash rate

Corridor System

- Actual cash rate managed by a *corridor system*
 - ① – floor: 10 basis points (.10%) below target
incentive to lend ESA balances above floor, closer to target
 - ② – ceiling: 25 basis points (.25%) above target
incentive to borrow ESA balances below ceiling, closer to target
- Within corridor, prevailing cash rate depends on *demand and supply* for ES balances

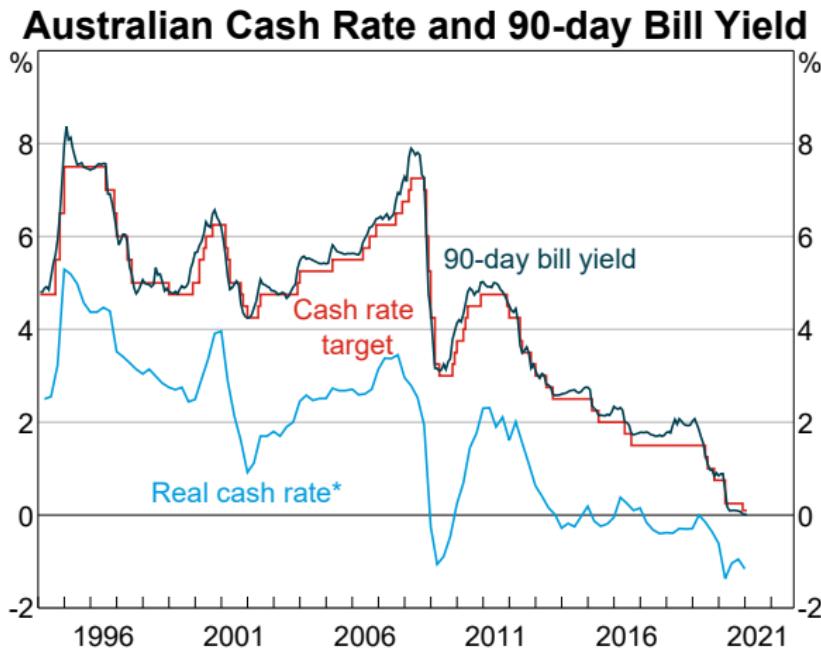
Corridor System



Demand and Supply for ESA Balances

- Net demand for ESA balances from banks themselves and on behalf of customers
- RBA forecasts daily demand for ESA balances
- Net supply of ESA balances controlled through *open market operations* where ESA balances are traded in exchange for government bonds
 - ① (i) *outright purchases or sales* of government bonds
 - e.g., buy government bond, pay with ESA balances, increase supply
sell government bond, receive ESA balances, decrease supply
 - ② (ii) *repurchase agreements (repos)*
 - e.g., today lend ESA balances collateralised by government bond,
temporary increase supply
reversed say 14 days later, return bond, reclaim ESA balances,
decrease supply

Cash Rate Target



* Calculated using average of year-ended weighted median inflation
and year-ended trimmed mean inflation

Sources: ABS; AFMA; ASX; RBA

Monetary Policy Transmission Mechanism

Connection to Longer Term Rates

short term interest rate → cash rate

- Close connection between short term and long term interest rates
- Consider class of bonds with some fixed risk characteristics, e.g., government bonds
- Within this class, short-term and long-term interest rates are linked by arbitrage opportunities
- For example, can always roll-over short-term positions to synthesise a long-term position
- Movements in short-term rates transmit to long-term rates

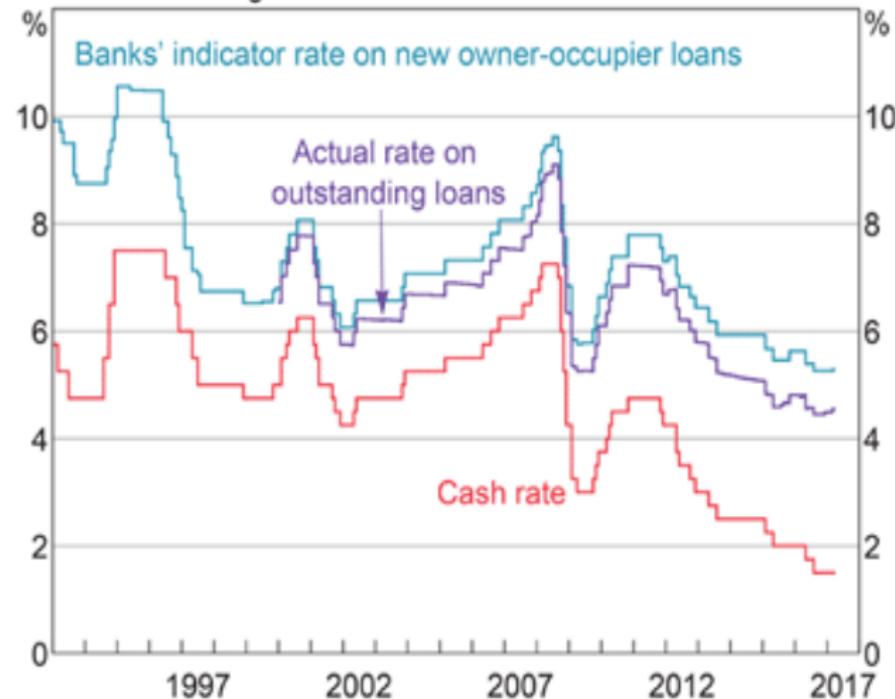
Connection to Riskier Rates

- Interest rates on riskier asset class can be thought of as rate on safe asset plus risk premium
- By moving long-term safe rate, monetary policy also transmits to long-term risky assets, e.g., mortgage rates
- In this way, changes in short term rates transmit to the most important rates facing households and firms
- But notice long chain of links, many places where this transmission can break down
short rate → safe long rate → risky long rate

Monetary Policy Transmission

Australian Housing Lending Rates

Average interest rate on variable-rate loans



Sources: ABS; APRA; Perpetual; RBA

Unconventional Monetary Policy

Unconventional Monetary Policy

how negative interest rate can be
↓

- Because of the corridor system, the *effective lower bound* on the RBA's cash rate target is 0.10 percent
- As the cash rate approached this lower bound, much attention turned to *unconventional monetary policy* tools, including
 - (1) negative interest rates
 - (2) extended liquidity programs
 - (3) asset purchases ('quantitative easing')
 - (4) forward guidance
- Items (2) and (3) are *balance sheet tools*

Balance Sheet Tools

- Central banks have balance sheets of *assets* and *liabilities*
- Assets traditionally include
 - government bonds, held outright or as repos
 - foreign exchange, gold
- Liabilities include
 - bank reserves, e.g., exchange settlement account (ESA) balances
 - currency, notes on issue
- Conventional monetary policy involves modest adjustments to balance sheet to hit policy interest rate targets, e.g., cash rate
- Unconventional monetary policy often involves more dramatic changes in balance sheet, both in overall *size* and in *composition*

RBA Balance Sheet

Statement of Liabilities and Assets

At close of business on Wednesday, 17 March 2021

$$\text{Asset} = \text{equity} + \text{liability}$$

Equity

liability

Liabilities	Movement since previous Wednesday	Assets	Movement since previous Wednesday
Capital And Reserve Bank Reserve Fund	14,159	- Gold and foreign exchange ^[1]	62,016 -956
Australian notes on issue	97,030	-90 Australian dollar investments ^[2]	320,878 3,428
Exchange Settlement balances	192,674	832 Other assets (including clearing items)	1,907 -389
Deposits (excluding Exchange Settlement balances)	69,487	2,340	
Other liabilities	11,451	-999	
Total	384,801	2,083 Total	384,801 2,083

RBA Balance Sheet

- Has changed dramatically
- Beginning March 2020
 - total size \$190b
 - ESA balances \$32b
 - currency, notes on issue \$83b
 - gold and foreign exchange \$100b
 - Australian investments \$89b
- 17 March 2021
 - total size \$384b
 - ESA balances \$193b
 - currency, notes on issue \$97b
 - gold and foreign exchange \$62b
 - Australian investments \$321b
- These changes reflect the implementation of unconventional policy.

(1) Negative Interest Rates

- Instead of earning interest, charged interest to store money
- Effectively a *tax on storing money* ⑨
- In response to the global financial crisis, *policy* interest rates in some countries did go negative
 - e.g., in Denmark, Sweden and Switzerland
most negative was -0.75 percent in Switzerland
- But these negative policy rates mostly not passed on by banks to consumers and firms. Actual *market* interest rates stayed positive
- Not used by the RBA in response to the coronavirus crisis

(2) Extended Liquidity Programs

illiquid asset, house
sell a house
↓
find a buyer
↓
not many house buyers
not many
↓
discount the price
not many perfect
substitute)

- In this context, *liquidity* refers to how easily an asset can be converted to cash
 - liquid asset can be bought or sold without much price impact
 - usually because there are many good substitutes for it, so bringing the asset to market has not much price impact
- Sometimes say a liquid asset trades in a *thick market* and an illiquid asset trades in a *thin market* 稠密市场
- Market liquidity (thickness) is not a fixed characteristic of nature, but changes with economic conditions

easy to find buyer

(2) Extended Liquidity Programs

- Most central banks have *lender of last resort* type facilities to help financial institutes navigate times of *temporary* market illiquidity
- Goal of such facilities is to help prevent financial institutions failing when they are ‘fundamentally sound’, especially institutions that play a key *systemic role*
- For example, a bank may need to repay a loan by selling an asset. But when the market for the asset is illiquid, the bank may have to sell at a big discount, sometimes known as a *fire sale*
- Problem may be so severe that at fire sale prices bank is insolvent
- But how do we judge when a bank is ‘fundamentally sound’?

(2) Extended Liquidity Programs

- Extended liquidity programs extend lender of last resort facilities
 - expanding the range of collateral accepted
 - * in particular, accepting *lower-quality* collateral to back loan to distressed bank
 - * for example, risky tranches of mortgage backed securities
 - expanding the set of ‘eligible counterparties’
- In general terms, making funding available at lower than usual cost

(3) Asset Purchases ('Quantitative Easing')

- The *outright* purchase of assets in an open market operation
- Sometimes loosely referred to as *printing money*. Why?
- Purchases of assets paid for by crediting ESA balances, increasing the amount of money in the ES system, thereby increasing the amount of money more broadly in the economy
- In other words, the central bank *expands its balance sheet*, creating new money and using that money to purchase assets
- Ironically, this was once the more usual tool for setting policy interest rates, before the switch to repos (temporary purchases)

(3) Asset Purchases ('Quantitative Easing')

- In response to the global financial crisis, US Federal Reserve and other central banks (but not the RBA) dramatically scaled up magnitude of asset purchase programs ('LSAPs')
- Large purchases of *high-quality assets* like government bonds from traditional counterparties, as in traditional open market operations
- Sometimes also purchases of *low-quality assets* like risky tranches of mortgage backed securities from broader range of financial institutions, as in the liquidity programs above
- Goal of such purchases is to increase demand for and hence drive down interest rates on broad range of assets
 - interest rates on risky assets, shrinking *risk premia*
 - interest rates on longer-term safe assets, shrinking *term premia*

(3) Asset Purchases ('Quantitative Easing')

- Two ways to conduct such programs
 - (i) setting *quantity targets*, letting market prices respond

purchase a particular amount
 - (ii) setting *price targets*, letting market quantities respond
- The term '*quantitative easing*' originates from Bank of Japan's use of such policies in late 1990s & early 2000s, in particular their use of larger quantity targets — i.e., more expansionary policy

(4) Forward Guidance

- Refers to *communication* of monetary policy. Two kinds
 - (i) *time dependent*, commitments not to change policy until a certain calendar date
 - (ii) *state dependent*, commitments not to change policy until certain conditions are met
- Basic idea is to reinforce the seriousness of the central bank's commitment to its unconventional policies
- Goal is to reduce uncertainty about the stance of future policy and make current policy more effective

Unconventional Monetary Policy in Australia

Unconventional Monetary Policy in Australia

- Was *not* a feature of our response to the global financial crisis
- Unlike other countries, where it was a dominant theme
- We mostly relied on conventional monetary policy and fiscal policy
- But *has* been a feature of the response to the coronavirus crisis

Monetary Response to Coronavirus Crisis

(1) *Cash rate*

- target at 0.10 percent
- corridor *floor* at 0 percent
- not negative

(2) *Extended liquidity programs*

- \$200 billion **Term Funding Facility** (TFF)
- 3-year loans at 0.25 percent, collateralised as per repo
- initial allowance based on existing bank lending
- additional 1:1 access if new loans to big business
- additional 5:1 access if new loans to small or medium business

Monetary Response to Coronavirus Crisis

(3) Asset purchases

– Yield Curve Control

- target 0.25 percent interest rate on 3-year government bond (AGS)
- price target, RBA has to be prepared to buy quantity required
- purchase by auction in secondary market
- purchases increase ESA balances

(4) Forward guidance

“... not increase the cash rate from its current level until progress was made towards full employment and that we were confident that inflation will be sustainably within the 2-3 percent range ... we are likely to be at this level of interest rates for an extended period.”

Next Lecture

- Aggregate demand and supply
- Framework for analyzing monetary and fiscal policy
- BOFAH chapter 11