

# Lecture 17: An overview of Money and Monetary Policy

ECON30009/90080 Macroeconomics

Semester 2, 2025

## Last Class

- Went through a model of search unemployment
- In that model, expected value of searching labour market always better than value of staying out of labour force **if** wage income higher than home production
- Or put differently, as long as the value of employment is better than the value of non-employment  $\implies$  search for a job
- Household decision in that model is trivial with no participation cost

## Wrapping up search

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- In that model, other key decision was whether to create a vacancy
- Under **free entry**, firms enter the labour market until the value of a vacancy is driven to zero
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## Recap RBC vs Search model of unemployment

- At the end of last class, we saw that the search model of unemployment had the feature that future TFP mattered for vacancy creation decisions at date 1
- This is different from the RBC model where only changes in current TFP can generate the correct business cycle co-movements.
- In RBC model without capital (to make it similar to search model)  $Y = z_t L_t$ ,  $w_t = z_t$  (from firm's optimality)  $\implies L_t$  can only rise if  $z_t$  rises
- In search model,  $Y_t = (1 - u_t)z_t + u_t h$ . Employment levels affected by vacancy creation decisions that are *forward-looking*.  $\theta_t, u_t$  also affected by future values.
- Presence of search frictions implies supply  $\neq$  demand, firm observes value to retaining worker

## NOMINAL VARIABLES, MONEY AND INFLATION

## Intro: why do nominal variables matter?

- Thus far, our discussion has focused on the **real economy**. Prices were all *relative* prices (relative to price of consumption good which was the numeraire)
- Thus, the RBC model focused on trade-offs in *real* variables. Nominal variables did not matter for the economy's equilibrium.
- In modern economies, however, all goods and services are priced in nominal terms, and money is the unit of account used to do that.
- This does mean that in the RBC model's current form, we cannot say anything about inflation
- Yet inflation is something that households and firms are very concerned about

## Introducing money

□ Simple fix? Introduce money into the model

□ We can then write things in nominal terms:

- Firm's profit maximization problem

$$\max_{K_t, L_t} P_t z_t K_t^\alpha L_t^{1-\alpha} - W_t L_t - P_t R_t K_t$$

where  $W_t = P_t w_t$ .

- which equivalently can be written as price  $\times$  real profit

$$\max_{K_t, L_t} P_t \underbrace{\{z_t K_t^\alpha L_t^{1-\alpha} - w_t L_t - R_t K_t\}}_{\text{real profit of the firm}}$$

In RBC, consumption good is numeraire good,  $P_t = 1$ . So looking at nominal variables redundant in RBC, as real is trivially the same as nominal when  $P_t = 1$



## But what does money do?

- ☐ Store of value
- ☐ Unit of account
- ☐ Medium of exchange

## Why do we hold money?

- Any asset can serve as a store of value (e.g., physical capital,  $a_{t+1} = k_{t+1}$  in our model), but most assets do not serve as a medium of exchange
- Money actually offers a worse store of value than other assets (**dominated asset**). Why? Because you can't earn interest from holding money
- The return on owning an asset like a house typically offers a higher return than the return on holding money.
- Why do people hold money? Because they value **liquidity** and because money is an **accepted medium of exchange**
- Money as a medium of exchange role eliminates the need for barter trade

# Why do we hold money?

- Liquidity: ease with which an asset can be converted into a medium of exchange
  - By definition, money is the most liquid asset because it is the medium of exchange
  - Conversely, a house is an illiquid asset. Need to find a buyer before you can get use the funds from selling the house to buy something
- Acceptance refers to the idea that if you sell goods and services in return for money, you must be confident others will be willing to accept/use money too

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- **Fiat money** (paper money and coins) then replaced commodity money.
- Fiat money is intrinsically valueless, but derives its value from its role as **legal tender**: an accepted currency

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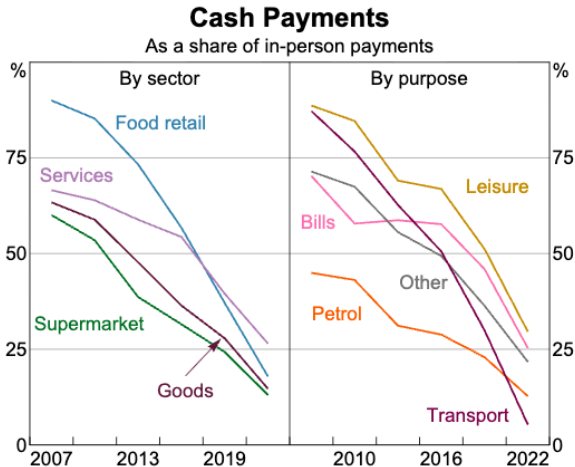
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- Most liquid form of money: **M1** = currency + current (cheque) deposits of the private non-bank sector at banks
- In the models we will study, we will assume that money in the model is = currency. Money will be a dominated asset that does not earn interest

# Declining use of cash



Source: RBA calculations, based on data from Colmar Brunton, Ipsos and Roy Morgan Research.

- Cash payments are an increasingly smaller share of total in-person payments
- Digital wallets, payments by card, direct account-to-account transfers have risen in place

Notes: From RBA June 2023 Bulletin

## A quick note

- Increased use of credit cards, and contactless payments (e.g. digital wallets) for most transactions
- But credit cards are not money
  - Rather payments with credit card are short-term loans from a credit card company to you
- Google Pay/Apple Pay/PayPal are not money
  - They represent payment technologies but are not money itself

## THE CENTRAL BANK

## Where does the central bank come in?

- **The Role of the Central Bank (CB):** by changing interest rates, monetary policy affects the opportunity cost of holding money, the cost of lending, and the supply of money.
- In terms of modeling, two ways to think about monetary policy implementation:
  - Standard textbook way: monetary policy sets money supply. Then given money demand of households, the nominal interest rate is determined in equilibrium
  - Most modern economic models: monetary policy sets the nominal interest rate (as most central banks do in reality), and stands ready to supply as much money as demanded at that interest rate.



## Where does the central bank come in?

- In setting the nominal interest rate, we typically assume the monetary policy follows some monetary policy rule ([Taylor rule](#)).
- The Taylor rule can be interpreted as a monetary policy reaction function which describes how monetary policy responds to the state of the economy.

## Estimating Interest Rate Rules

- The traditional/simplest Taylor rule estimates are based on:
  - the inflation rate plus an “equilibrium” real fed funds rate
  - a weighted average of two gaps: an **inflation gap** and an **output gap**.

$$i_t = \Pi_t + r_t^* + \omega_{\Pi}(\Pi_t - \Pi_t^*) + \omega_y(y_t - y_t^*)$$

- The coefficients of the Taylor rule represent how much *weight* the monetary authority puts on supporting price stability vs. stabilizing output.
- Taylor estimated  $\omega_{\Pi}$  and  $\omega_y$  using historical data and found that this rule summarizes nominal interest rate movements in the U.S. quite well.

## Interpreting Taylor Rules

- An equation like the Taylor rule can be interpreted as a **monetary policy reaction function**, which describes how the monetary instrument responds to the state of the economy.
- A central bank's behaviour (e.g., tolerance for inflation vs. output/employment variability) can be inferred from the coefficients estimated within the Taylor rule.
- The Taylor rule has been modified in many ways by including
  - lagged interest rate
  - forward-looking variables (e.g., replace  $\Pi_t$  with  $E_t(\Pi_{t+1})$ )

## MONETARY POLICY IN ACTION

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- Goals and targets:
  - Final goals: common theme of employment and price stability, but relative weights on each objective can vary.
  - Intermediate target: Inflation target (or target range)
  - Operating target: usually a short-term (overnight) interest at which banks lend to each other (the price of money).

# Goals, Targets and Tools of Monetary Policy

- Monetary policy refers to actions by a central bank that manages money supply, interest rates, and credit availability to achieve their policy goals.
- In Australia the three goals of monetary policy are to promote/maintain:
  - Stability of the currency (price stability);
  - Full employment (output/employment stability); and
  - Economic prosperity and welfare of the Australian people.
- Goals of monetary policy can differ across countries: the US Federal Reserve has a dual mandate (price and employment stability), the Bank of Canada has a single mandate (price stability)

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  - By price stability, we mean a low level of inflation. Inflation itself is economically and socially costly and can affect household's spending and investment plans



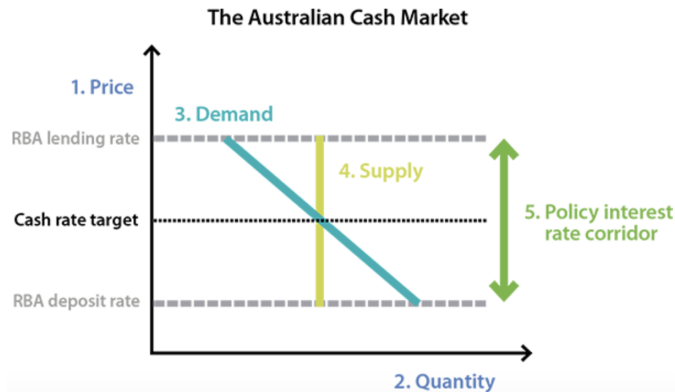
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  - By price stability, we mean a low level of inflation. Inflation itself is economically and socially costly and can affect household's spending and investment plans
- BUT, it still allows for some flexibility to use monetary policy to stabilise output/employment fluctuations too.

## Implementing the Operating Target

- There are three conventional monetary policy tools a central bank can use to manage the policy/cash rate: **open market operations**, **discount rate**, and **reserve requirements**.
  - Open market operations: buying and selling short-term government bonds in the open market (repurchase agreements) to target their desired overnight cash rate.
  - The discount rate (lending rate): interest rate charged by the central banks for loans it makes through the central bank's discount window.
  - Interest on reserve balances: interest paid on funds that banks hold in their reserve balance accounts at a central bank
- These three tools together allow central banks to achieve their desired operating target.

# The cash rate (policy rate)



Source: RBA.

For more information: see <https://www.rba.gov.au/education/resources/explainers/how-rba-implements-monetary-policy.html>

- Cash market: overnight interbank lending
- RBA deposit rate  $\sim$  0.1 ppt  $<$  target cash rate (floor)
- RBA lending rate  $\sim$  0.25 ppt  $>$  target cash rate (ceiling)

## The policy rate

- Central banks set the policy rate to achieve their intermediate and final targets.
- With any policy rate decision, central banks typically convey information about the factors influencing their decisions and how they expect the economy to evolve in the future.
- Central bank communication important for expectation formation of households and firms

# Central bank decisions and communications

## □ Decision process:

- The formulation of monetary policy is the primary responsibility of the Reserve Bank Board.
- The Board normally meets eleven times each year, on the first Tuesday of the month except in January.
- For each meeting, the Bank's staff prepare a detailed report of developments in the Australian and international economies, and in domestic and international financial markets.
- The reports contain a recommendation for the policy decision.
- Decisions by the Reserve Bank Board to change the cash rate are made, and communicated publicly afterwards.

## MONETARY POLICY IN OUR MODELS

# Modeling money

- A few ways to introduce money into the model:
  - Cash-in-advance constraint (need to put aside some money to make some purchases)
  - Shopping time model (both time and money required to make purchases. Time spent shopping declining in money balances held)
  - Money in the utility function (direct utility from holding money)

## What can monetary policy do?

- In an RBC model with money, monetary policy can only affect nominal variables
- In a New Keynesian model, monetary policy can affect **both** nominal and real variables
  - A key difference: presence of nominal rigidities or sticky prices give rise to real effects of monetary policy (we will explore this later)



## Wrapping up

- Today, a first look at money and monetary policy
- Next class: money-in-the-utility function model