

Intermediate Macro [1]

①

What is macroeconomics?

↳ Macroeconomics study the aggregate performance of an economy over time

why?
how can we improve it?
performance → ↑ welfare

main key indicators of an economy's performance

- production:
 - real GDP
 - ↳ gross domestic product
 - Real GDP per person
 - ↳ average income
 - Real GDP per worker
 - ↳ productivity
- unemployment: joblessness
- inflation: growth in prices

1st GDP: Gross Domestic Product

↳ value of all final goods and services produced within a country during a given period of time

ex: economy where apples and bananas are produced

one good:

$$n. GDP = P \times Q$$

$$Q = \frac{GDP}{P}$$

↑
real GDP

$$GDP = P_B \cdot Q_B + P_A \cdot Q_A + \dots$$

↑ price of bananas
↑ quantity of bananas
value of bananas

value of apples

(2)

note: This is called nominal GDP

↳ this is a measure of value, not a measure of quantity

nominal GDP can \uparrow even if q_B and q_A remain the same (no increase in production) if there are increases in p_A and p_B (inflation) ex: p_A and p_B doubles, GDP \uparrow without \uparrow in production

∴ this is not an appropriate measure of the quantity of goods produced. What is?

ex: say that $q_A = 0$ for another country (ie only produces bananas)

Then, $GDP(\text{nominal}) = p_B \cdot q_B$

∴ we can get q_B from

$$\frac{GDP}{p_B} = q_B!$$

↳ this is called real GDP

(quantity measure)

But what do we do if $q_A > 0$?

↳ we cannot divide GDP by p_A and p_B . we need a price index.

ex: $p = \frac{1}{2} p_A + \frac{1}{2} p_B = \text{average price}$

then $\frac{GDP}{P} \approx$ approximate measure of quantity ③

$$= \frac{\text{total value}}{\text{average price}} \approx \text{average quantity}$$

→ there are several ways to obtain this price index in practice.

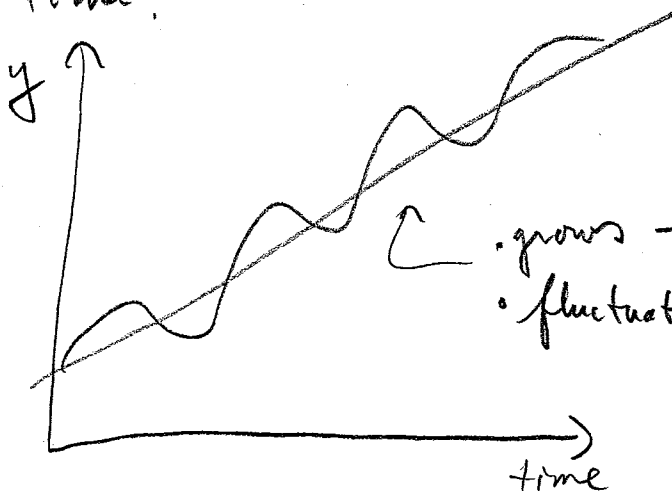
- Most common:
- GDP deflator
 - CPI (consumer price index)

• real GDP per person = $\frac{GDP}{\text{population}}$ = average number of goods produced per person

↓
This allows comparison across countries with different populations

measures of average real income
↳ effect of inflation removed

• what does real GDP per person look like over time?



- grows → ↑ income
↳ richer now than before
- fluctuates ⊕
⊖ Business cycle
• recession
• expansion

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2% unemployment (u)

↳ unemployment rate

$$= \frac{\text{\# of people unemployed}}{\text{\# of people in the labour force}}$$

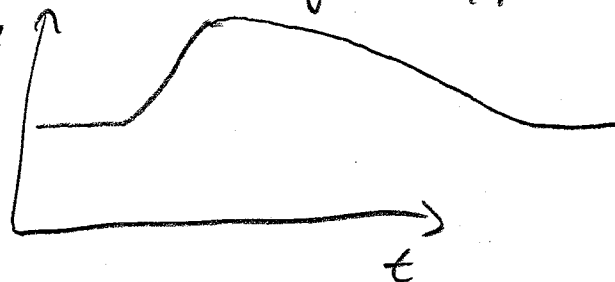
↳ are working or looking for work

main feature?

↳ rise rapidly in recession but declines slowly in expansion

why care about "u"

ie u



←

- direct effect on welfare
- crime
 - deaths → suicide
 - social unrest
 - poverty

3%

inflation (π) → measures how rapidly price are rising (or falling)

$$\text{inflation rate} = \frac{P_t^{\text{year } t} - P_{t-1}}{P_{t-1}} \times 100$$

deflation

why care about "π"?

→ purchasing power

• high inflation → ↓ purchasing power (buy less with same amount of money)

• deflation → ↑ purchasing power
↳ but might want to wait for better bargain!

our goal? \rightarrow try to understand
what influences the
behaviour of those variables

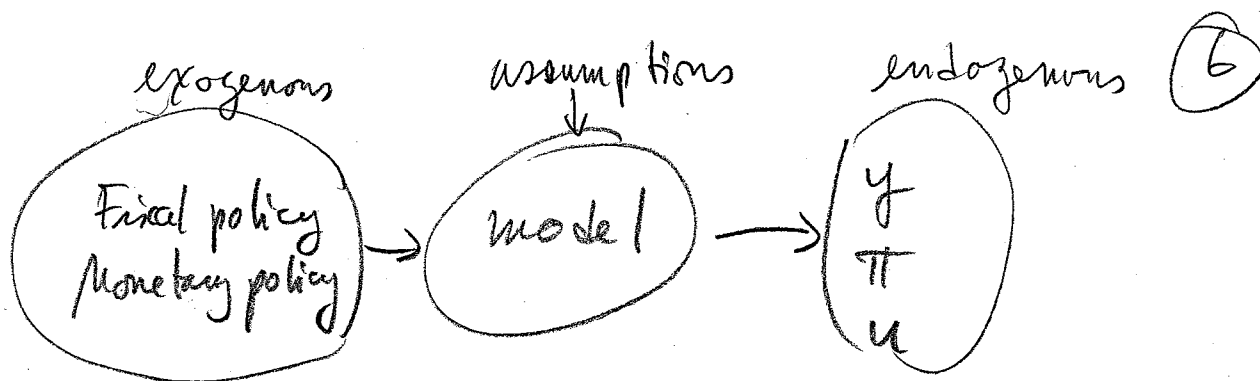
why? Can the government do anything
(policy) to improve the economy's
performance?

\hookrightarrow How do economists do that?
They build models

Models

- models are abstraction (simplification) of reality meant to capture the essential of economic interactions
- They are used to predict the behaviour of endogenous variables (real GDP (y), inflation rate^(π), unemployment rate^(u)) given a set of exogenous variables (government spending, monetary policy, weather, etc...)

\hookrightarrow if we understand how y , π , u moves when exogenous variables are varied then an effective policy could be designed



Example: simplest model of supply and demand

assumptions

- $Q^d = D(P, Y^d)$
 - P : price
 - Y^d : disposable income (income minus taxes)
 - assumptions: \ominus (for P), \oplus (for Y^d)
- $Q^s = S(P, P_m)$
 - P : price
 - P_m : price of inputs (cost)
 - assumptions: \oplus (for P), \ominus (for P_m)
- P adjust so that $Q^s = Q^d$

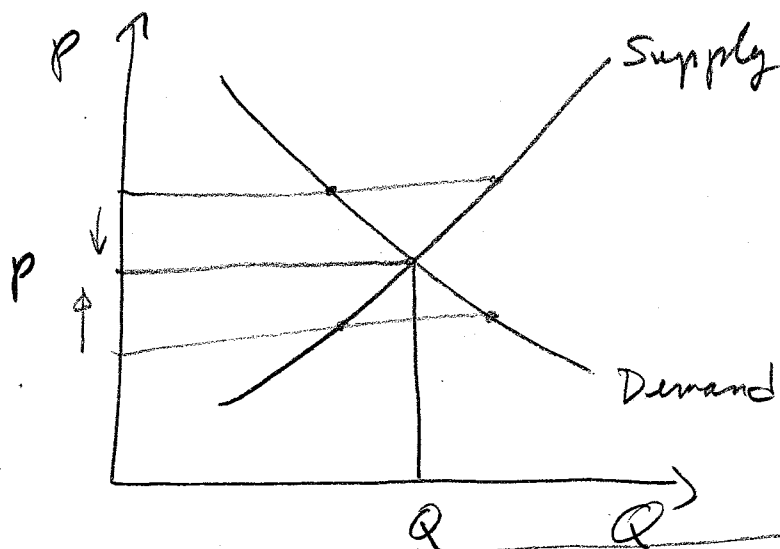
note:

- Q and P are endogenous
- Y, P_m , and T are exogenous

Diagram illustrating the flow of variables:

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    graph LR
      A([Y  
Pm  
T]) --> B([model])
      B --> C([Q  
P])
  
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$$Q^d = 60 - 10P + 2Y^d \quad D(P, Y)$$

$$\hookrightarrow 10P = 60 + 2Y^d - Q$$

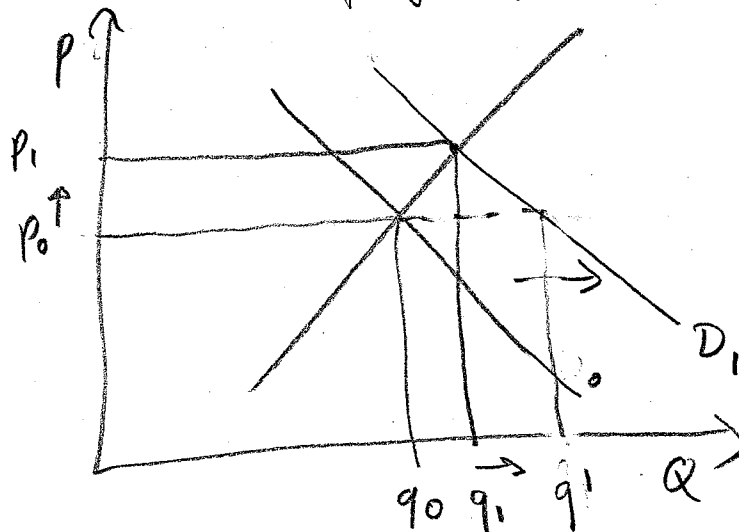
$$P = 6 + 0.2Y^d - 0.1Q$$

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• predictions of this model?

\uparrow in Y ?

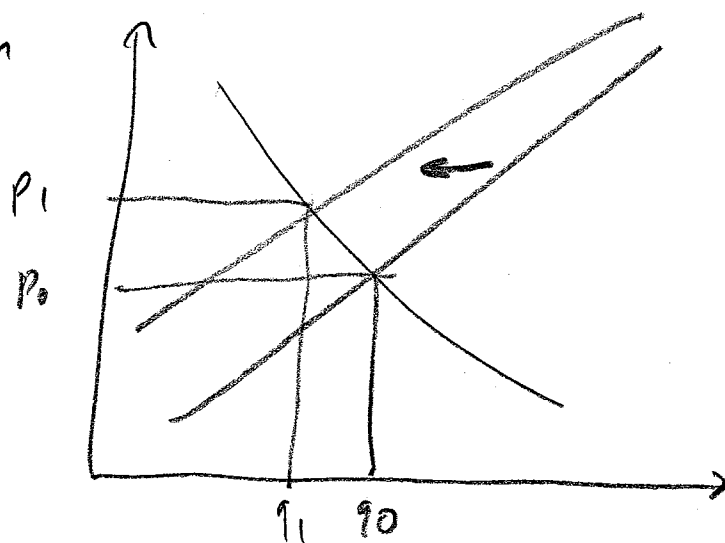
$\rightarrow \uparrow Y \rightarrow \uparrow$ demand (more income, buy more)
for given price



excess demand at $Q_1 \rightarrow \uparrow$ price (scarcity effect)
at P_1 , demand = supply

$\therefore \uparrow Y \rightarrow \uparrow P$
 $\rightarrow \uparrow Q$

$\uparrow P_m$



$\therefore \uparrow P_m \rightarrow \uparrow P$
 $\rightarrow \downarrow Q$

($\uparrow Y \rightarrow \uparrow Q$
but more $\uparrow P$)
(policy choice
subsidies)