AGENDA

- IS relation
  - Derivation of IS curve
  - Slope of IS curve
  - Shifts of IS curve
- LM relation
  - Derivation of LM curve
  - Slope of LM curve
  - Shifts of LM curve
- **IS-LM combined**
- Changes in Equilibrium under IS-LM

IS-LM EQUILIBRIUM

- Up to this point, we have seen that
  - Interest rate determines income in the product market
  - However, income determines interest rate in the money market
- This circularity implies that both are jointly determined
- Economists capture this idea using the concept of IS-LM equilibrium

IS-LM EQUILIBRIUM

- IS-LM equilibrium is the equilibrium "r" and "y" where both product and money market are under equilibrium

LM curve ↑

↳ interest rate is determined! (real money demand = real money supply)

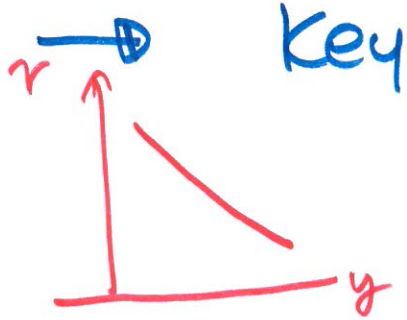
↳ firms sell/produce goods/output → IS curve.

- Graphically, the equilibrium is the "intersection point" between IS curve and LM curve

Cross point → the joint equilibrium of "r" and "y"

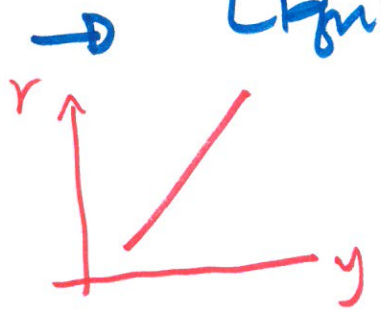
IS-LM Equilibrium

① Joint Determination of "income/output" (y) and "interest rate" (r)



Keynesian Cross frame work

"r → y"



Liquidity Preference Model

"y → r"

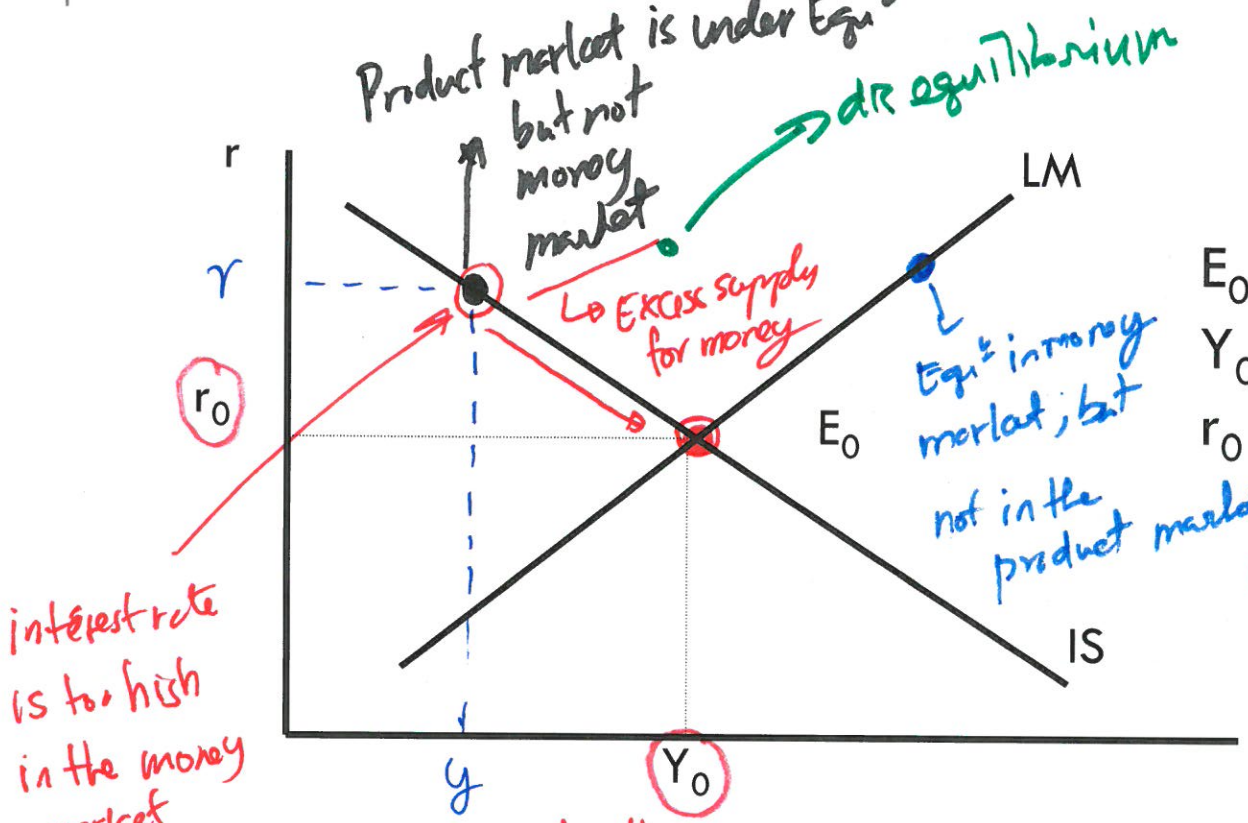
"simultaneous determination"

Combine together the concept of IS equilibrium and LM Equilibrium,

"Disequilibrium Adjustment" → how does the economy correct the disequilibrium??

IS relation	LM relation	IS-LM combined	Change in equilibrium

IS-LM EQUILIBRIUM



Product market is under Equ^m but not money market → dis equilibrium

↳ Excess supply for money

Equ^m in money market, but not in the product market

interest rate is too high in the money market

E_0 "IS-LM equilibrium"

Y_0 Equilibrium income

r_0 Equilibrium interest rate

(r_0, y_0) → Both money market and product market are in the equ^m.

other combinations of "r" and "y" (not at the point E_0)

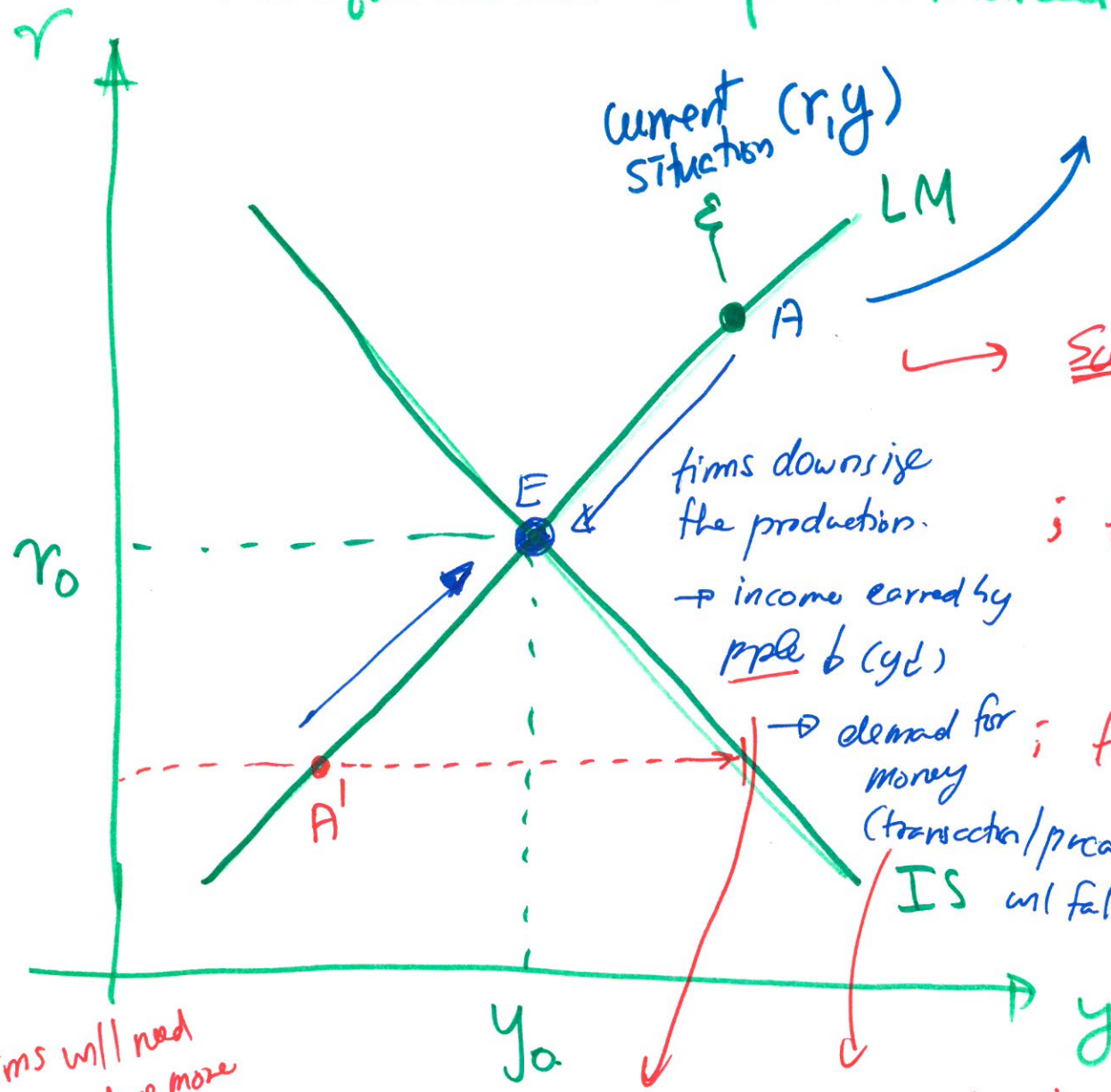
⇒ Not the IS-LM Equilibrium.

⇒ Disequilibrium

~~The~~ "r" and "y" at the ~~wrong~~ intersection point

⇒ IS-LM Equilibrium

Disequilibrium in product market.



A is NOT the IS-LM Equ^{m}

→ Disequilibrium at point A

↳ ~~Suplus~~ Surplus in the product market;

firms downsize the production.

→ income earned by ppl ↓ (y_d)

→ demand for money (transaction/precaution) ↓ ; firms cutting down the output or the supply.

IS will fall ⇒ r ↓

↓

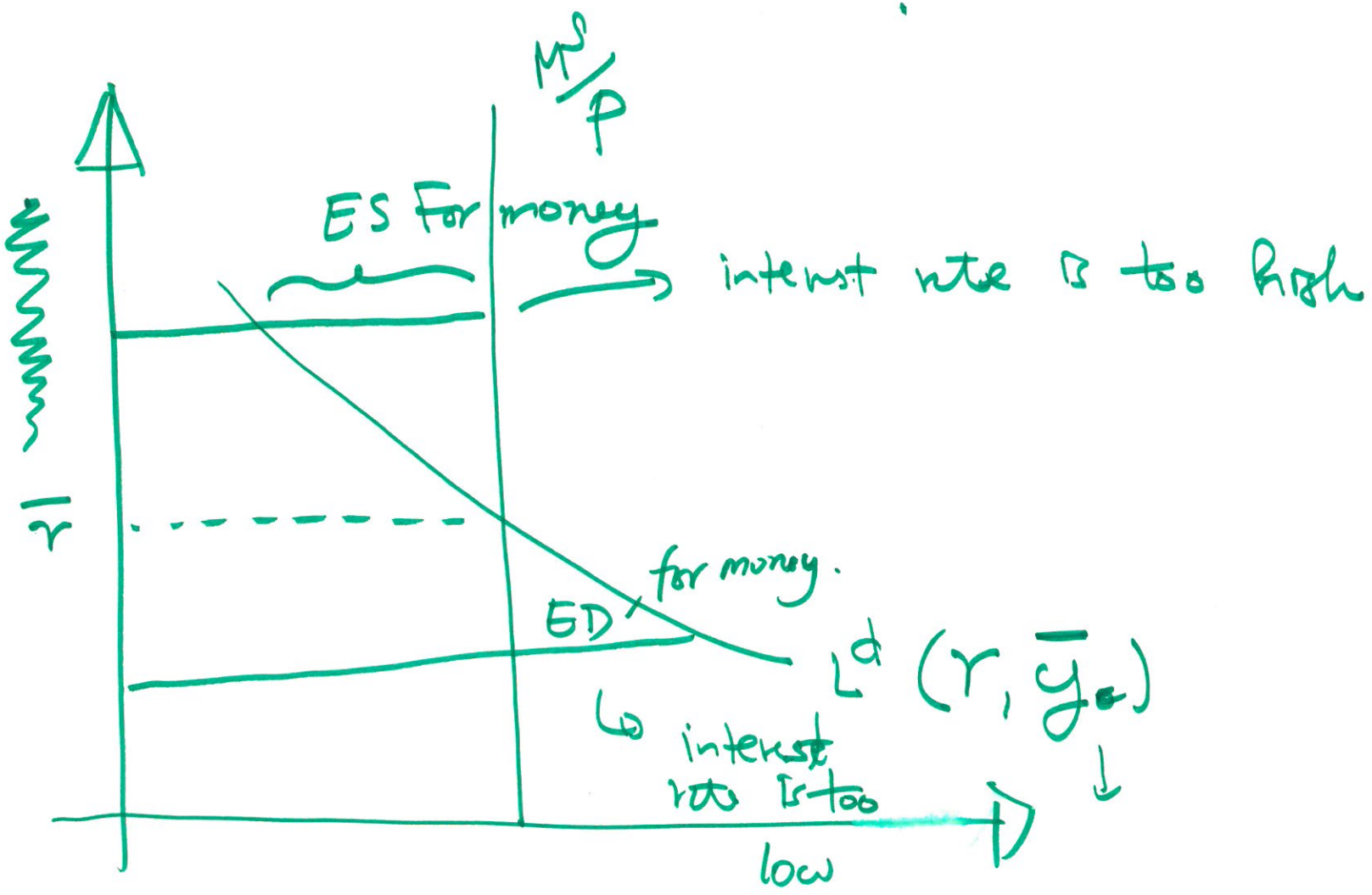
income is lowered as well

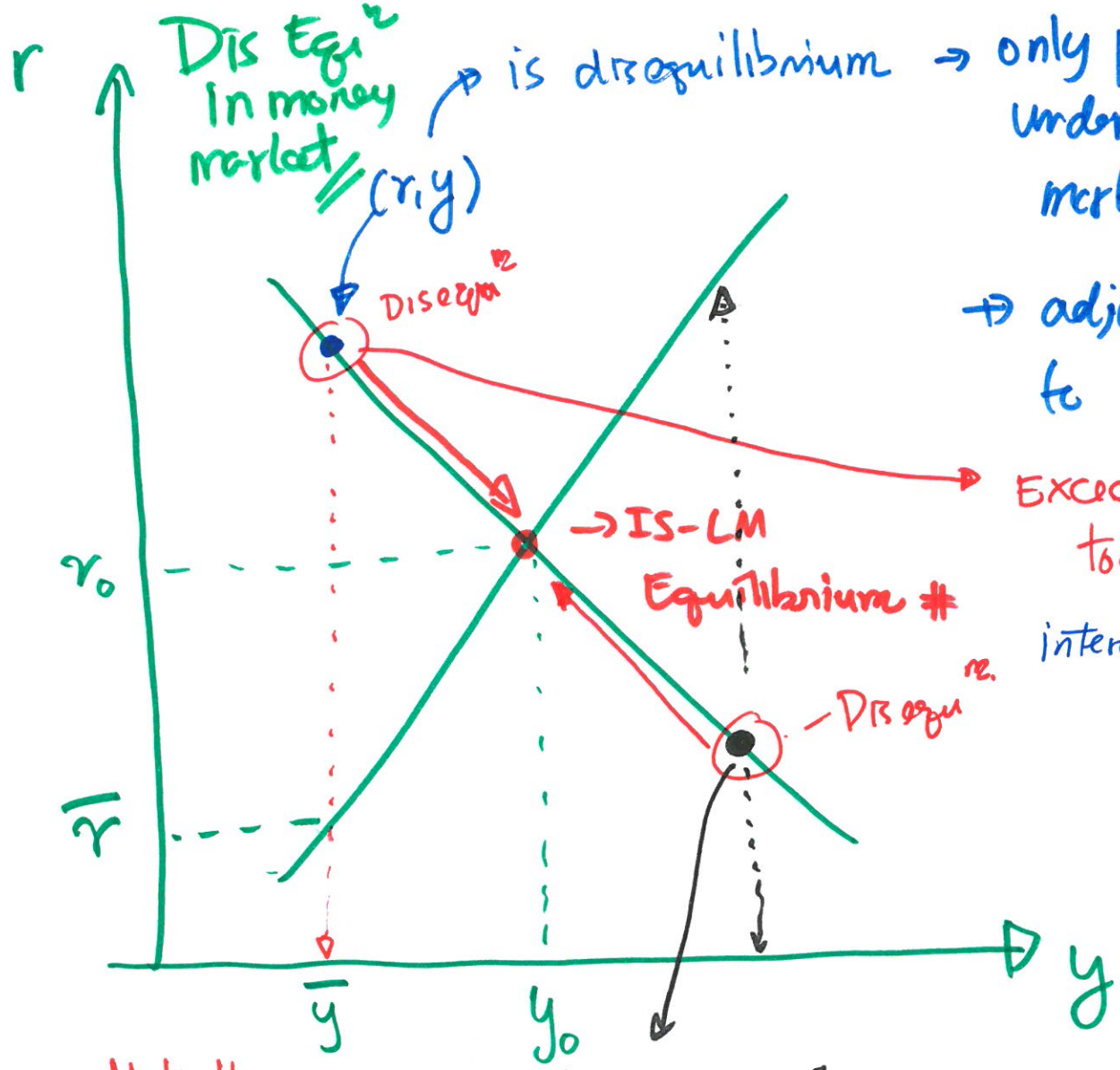
firms will need to produce more to clear the shortage problem

↳ income gets generated more ↑ → Demand for money increases → r ↑

people

Transaction / precautionary demand for money.


M^s/P
ES For money
interest rate is too high
$\bar{r}$
ED
for money.
$L^d(r, \bar{y}_0)$
↓
interest rate is too low



Dis Equi in money market → is disequilibrium → only product market is now under Equi*; but not money market

⇒ adjustment process will take place to correct the disequilibrium.

Excess supply for money
too high level of the interest rate.

interest rate falling gradually → Excess money supply can be eliminated

$\bar{C}, \bar{I} \uparrow \Rightarrow \overline{AE} \uparrow$

⇓

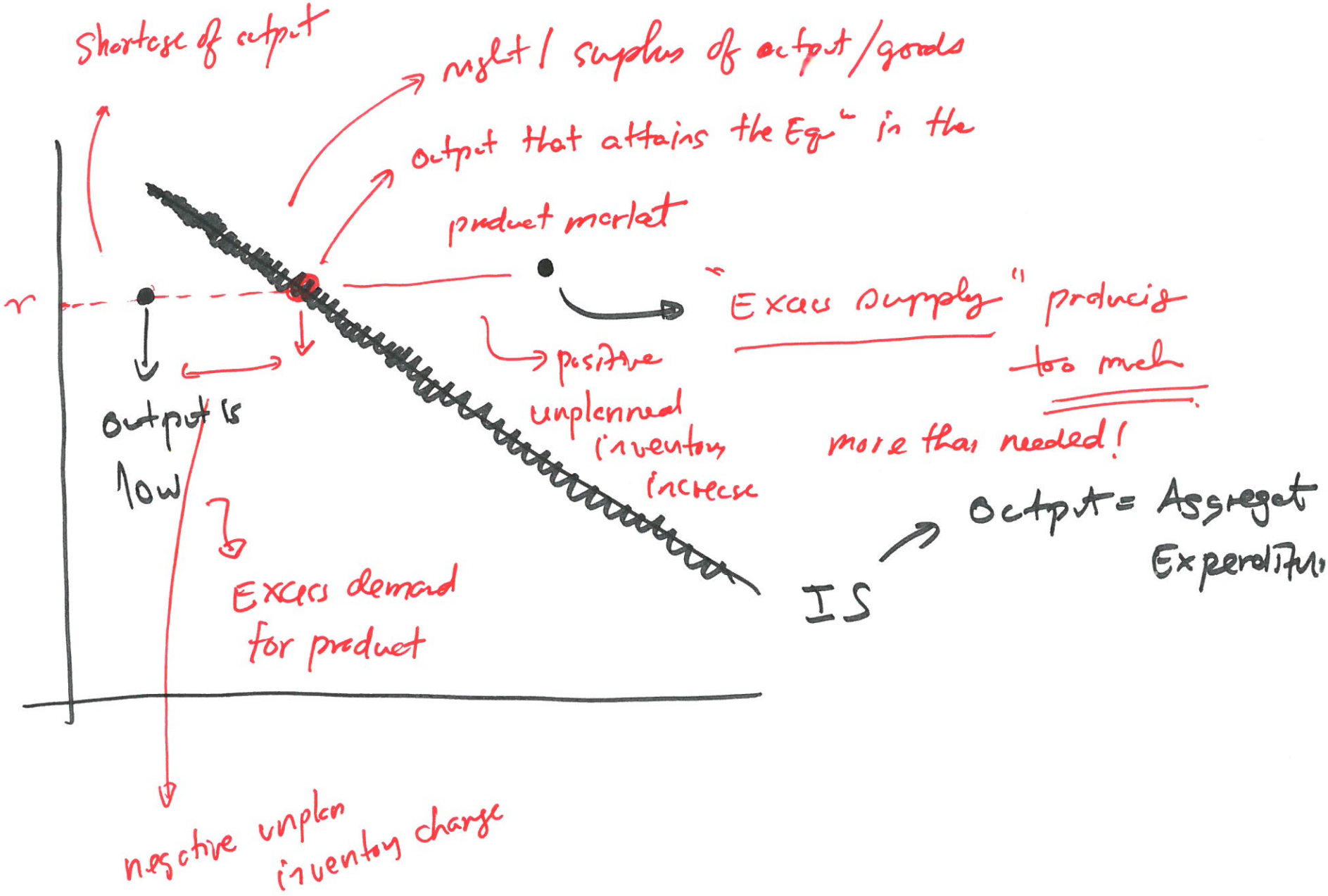
firms need to produce more to respond to an increase in AE; driven by the falling of interest rate

Not the IS-LM Equilibrium → not IS-LM Equi* Disequilibrium.

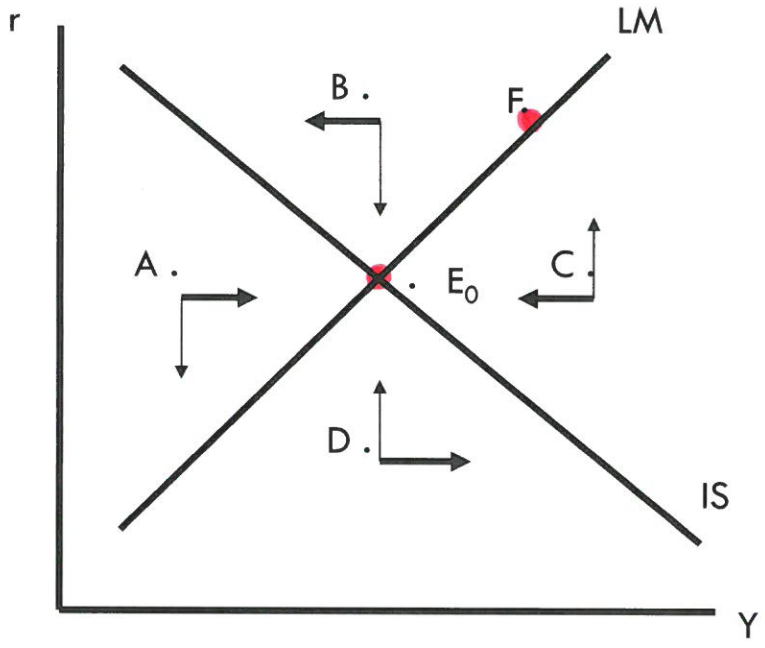
"too low interest rate"

$r \uparrow \Rightarrow \bar{C}, \bar{I} \downarrow$

$\overline{AE} \downarrow \Rightarrow y \downarrow$ along with higher $r \uparrow$

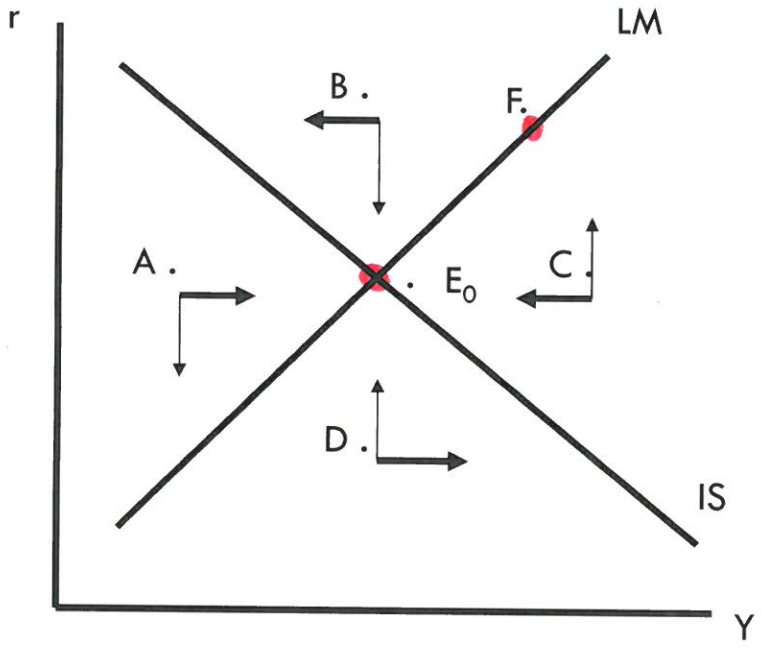

Shortage of output
output that attains the Eq^m in the product market
r
"Excess supply" produces too much
positive unplanned inventory increase
more than needed!
output is low
Excess demand for product
IS
Output = Aggregate Expenditure
negative unplan inventory change

IS-LM EQUILIBRIUM: DISEQUILIBRIUM



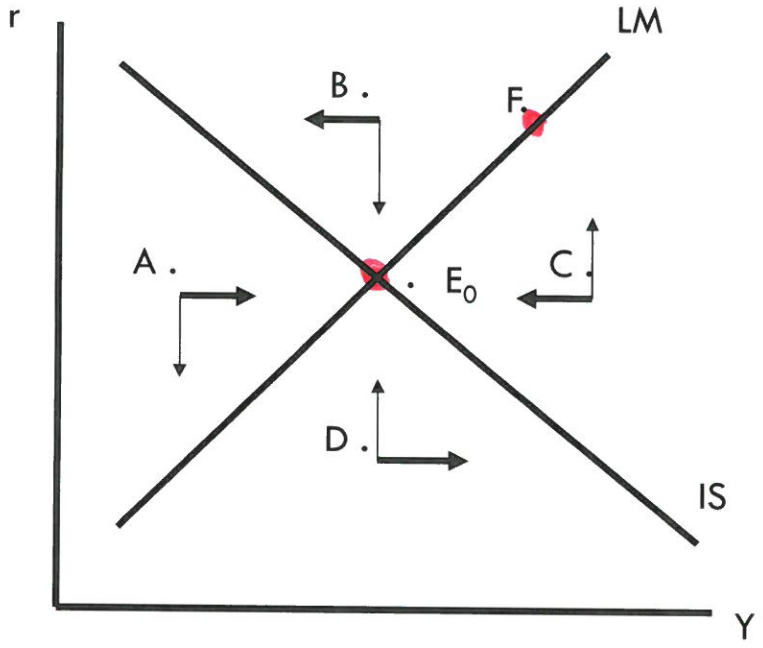
- Each point (off the intersection) represents disequilibrium
- Economy will find its way to adjust towards E0
- Mechanism?

IS-LM EQUILIBRIUM: ADJUSTMENT



- Suppose we start from A

IS-LM EQUILIBRIUM: ADJUSTMENT



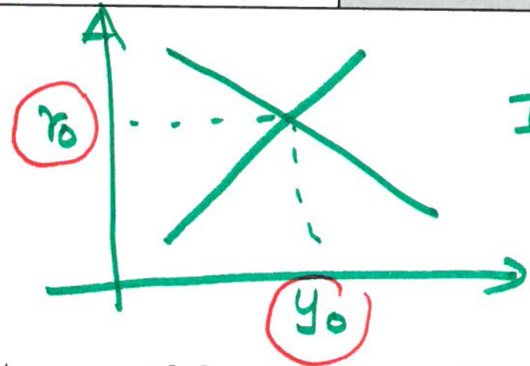
- Suppose we start from C

AGENDA

- IS relation
  - Derivation of IS curve
  - Slope of IS curve
  - Shifts of IS curve
- LM relation
  - Derivation of LM curve
  - Slope of LM curve
  - Shifts of LM curve
- IS-LM combined
- **Changes in Equilibrium under IS-LM**

IS relation	LM relation	IS-LM combined	Change in equilibrium

CHANGE IN EQUILIBRIUM



curve IS Intersects with LM curve (r0, y0)

- Our economy will remain at the IS-LM equilibrium as long as everything stays fixed

keep all other factors affect IS/LM curve fixed!

- The equilibrium will be changing when the factors affecting IS and LM curve change

↳ "change in the Equilibrium"

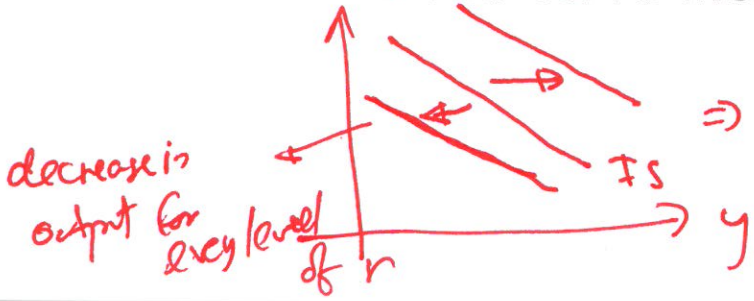
"[illegible]" r; [illegible] y" ⇒ "Factors"

↳ factors affect IS / LM changing

CHANGES IN EQUILIBRIUM

factors - causig the IS/LM to shift

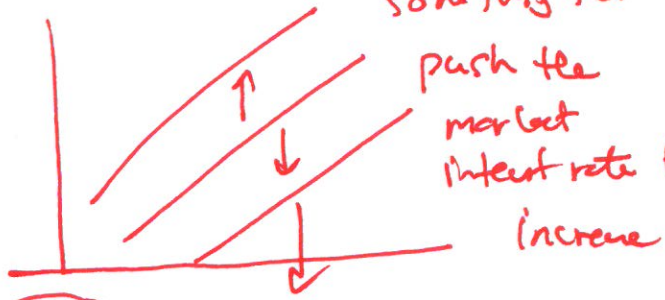
- Factors affect IS curve
  - What causes the IS curve to shift is the change in autonomous expenditure
  - Whatsoever affects that autonomous expenditure move the whole IS curve then



⇒ increasi in output for every level of "r"

- Factors affect LM curve
  - Non-income factors that affect money demand
  - Factors affecting real money supply

factors



something that push the market interest rate to increase

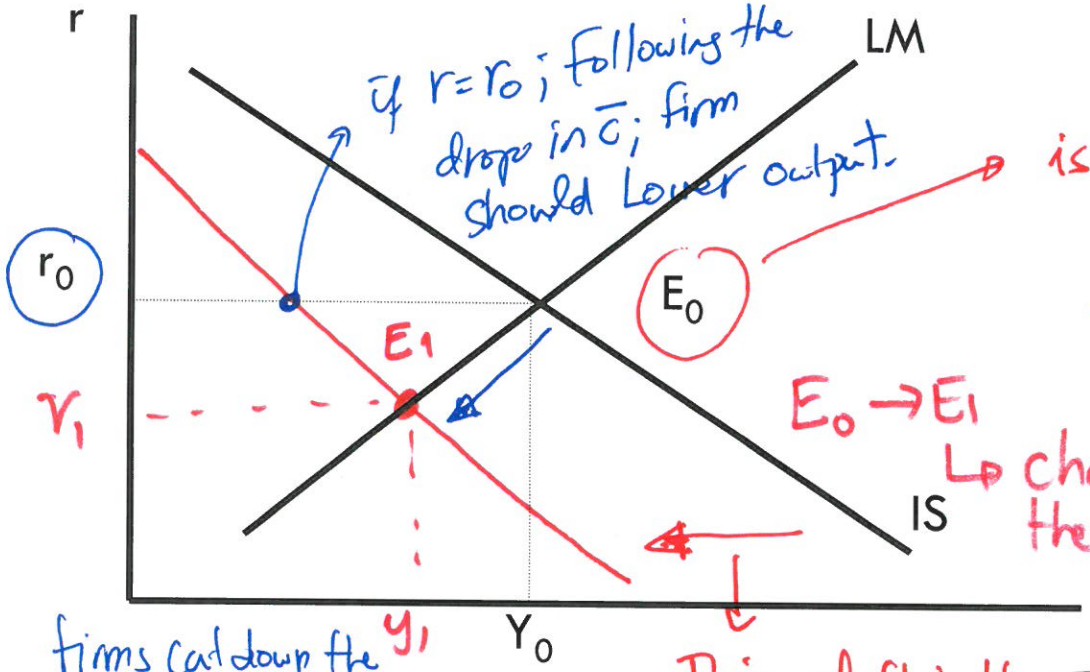
factors → something that push the market interest rate to fall

CHANGES IN EQUILIBRIUM

- Consider a drop in the autonomous consumption

↳ can occur b/c for example a fall in consumer confidence

↳ affects the IS curve



If $r = r_0$; following the drop in $\bar{c}$; firm should Lower output.

E_0 is no Longer the Equ^m under the new situation!

Before → E_0 is Equ^m 2 ; but after a drop in the $\bar{c}$ → y_0 is considered to be over production, relative to the new IS curve.

$E_0 \rightarrow E_1$ ↳ change of the Equilibrium; due to the falling of autonomous consumption.

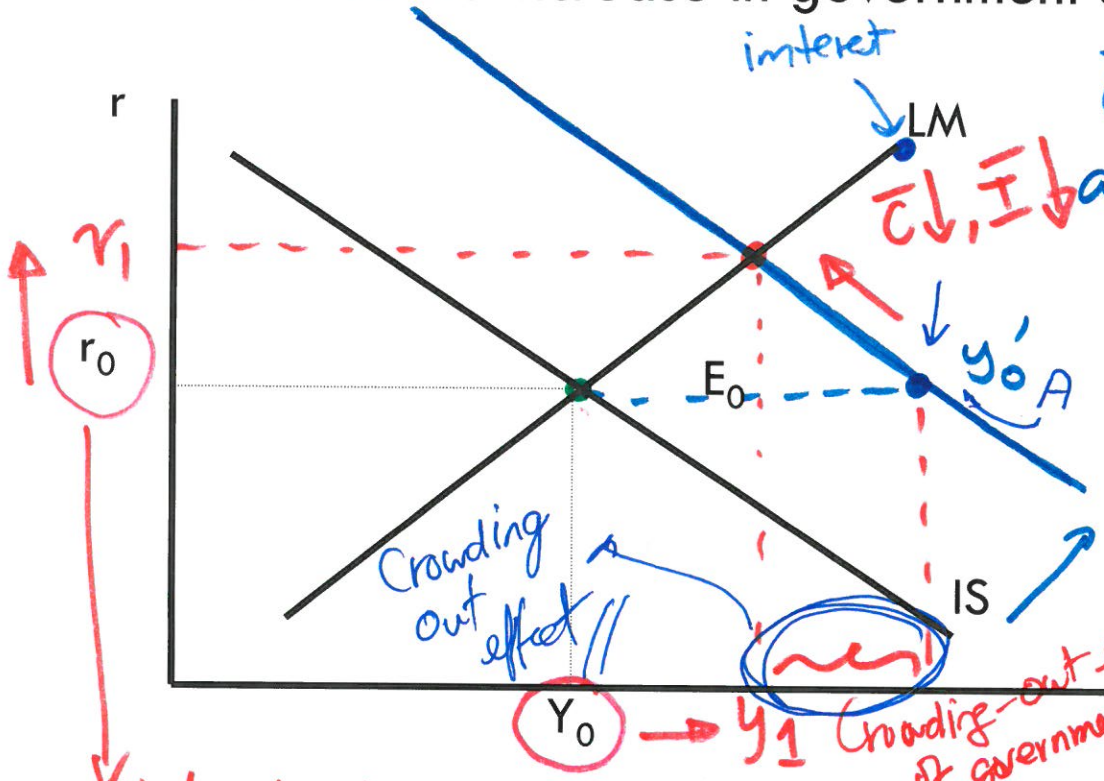
firms cut down the production, responding to a drop in $\bar{c}$; → cause interest rate to fall along with

This shift in the IS curve is to capture the effect of the drop in autonomous consumption ($\bar{c}\downarrow$)

CHANGES IN EQUILIBRIUM

↗ IS curve will shift

- Consider the increase in government spending (consumption/investment)



$\bar{G}\uparrow \Rightarrow$ IS shift right.

$\bar{C}\downarrow, \bar{I}\downarrow$ at $r_0 \Rightarrow$ produce at y_0 is too low

y_0' is the new desired level that firms should be producing $\Rightarrow$ to match with the rise of $\bar{G}$.

IS' (Due to the increase in $\bar{G}$)

$y_0' \Rightarrow$ Eqⁿ of "$r = r_0$"

Crowding-out effect of government expenditure.

is (r_0, y_0') → representing the Eqⁿ??

interest rate cannot be fixed at r_0 forever

- r_0 is considered to be too lowe compared to the Equilibrium in money market.
- interest rate is therefore rising!

→ ~~inter~~

Crowding-out Effect of government expenditure

⇒ an increase in $\bar{G}$ → to move the market interest rate ↑

↓

Create unintended impact to private spending. ⇒ a small amount of reduction in the AE

Side effect: B/C r↑ along with higher $\bar{G}$

Partially offset the Effect of the increase in $\bar{G}$

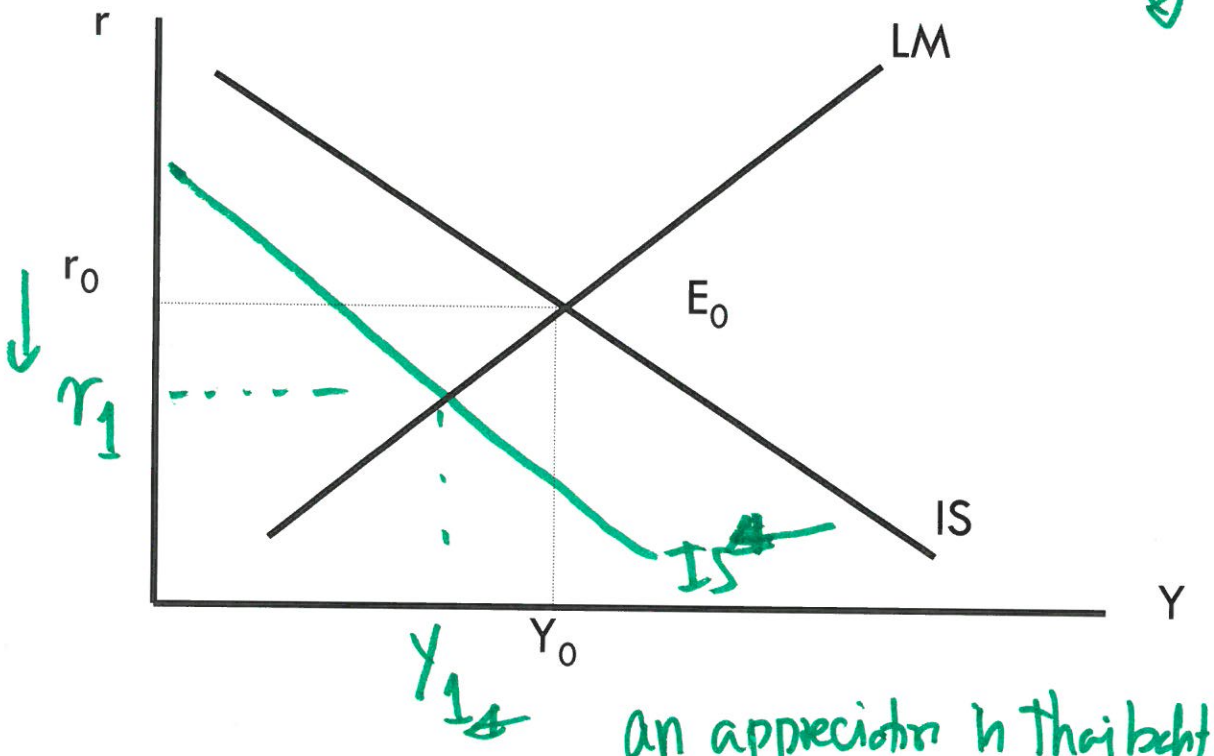
The increase in output followed from the rise in $\bar{G}$↑ would likely be less than when compared to the situation with fixed "r"

CHANGES IN EQUILIBRIUM

e ⇒ 1$ = 25 ⇓ 1$ = 10 — 4$ — 100 B = 10$

Baht is gaining more value

- Consider an appreciation in the Thai baht



Exports / imports

↓

negatively hit

Exports ↓ Imports ↑

NX ↓ ⇒ AE ↓

IS curve shifted

an appreciation in Thai baht → negatively hits the level of firm production / real GDP