Measurement (review)

- Output:
  1) Nominal GDP: $\$Y_t$
  2) Real GDP: Y_t

- Growth Rates: $\dfrac{X_{new} - X_{original}}{X_{original}}$

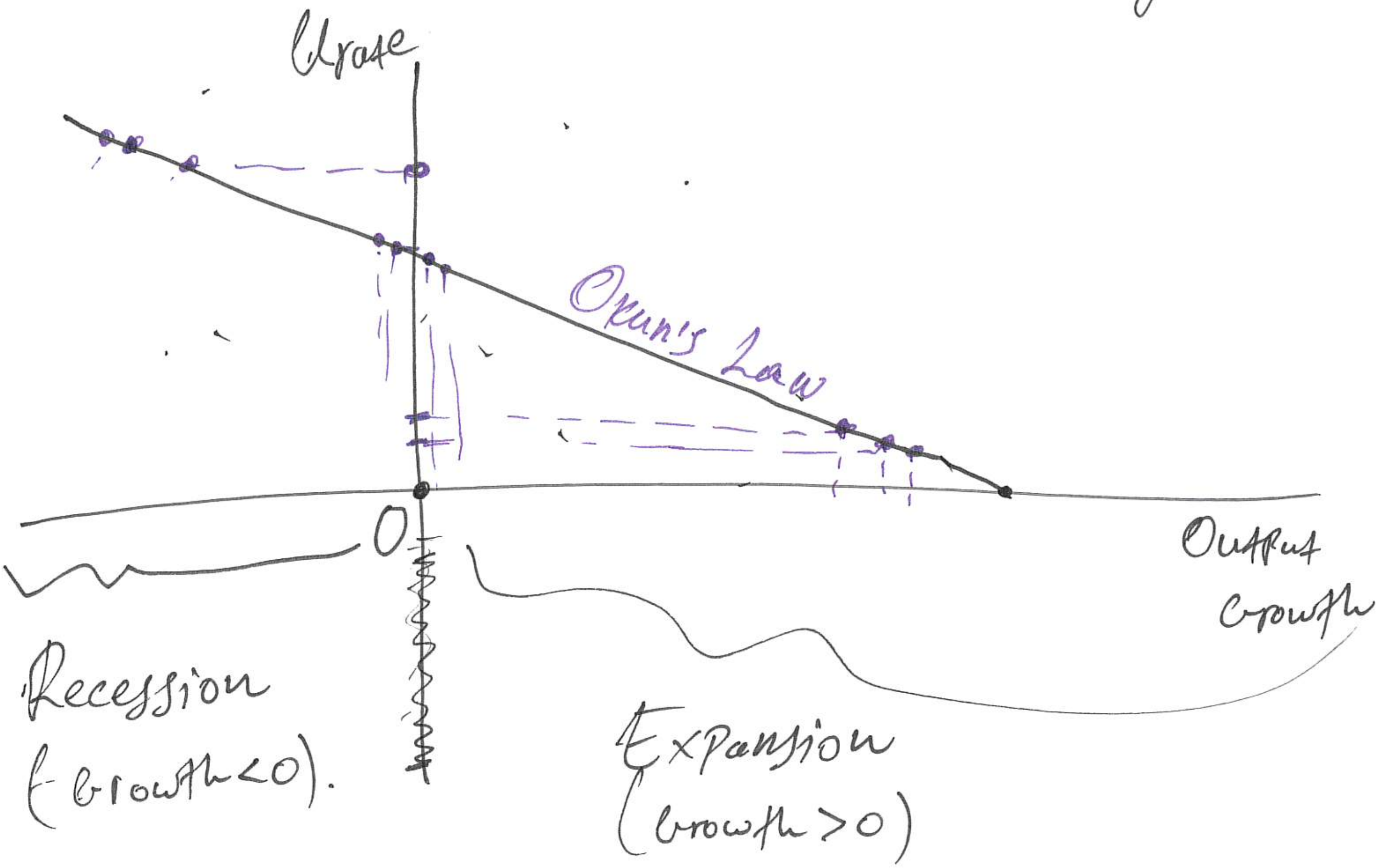
  If Growth Rate of Y b/w two years is Positive → Growth/Expansion

- Unemployment Rate: $U_{rate} = \dfrac{U}{E+U}$

  Labor force: $E+U$

  Participation Rate: $\dfrac{\text{Labor Force}}{\text{\# Persons able to work.}}$

Okun's Law: U_{rate} is negatively related to output growth.



Inflation Rate:

① GDP Deflator: $P_t = \dfrac{\text{Nominal GDP}_t}{\text{Real GDP}_t}$

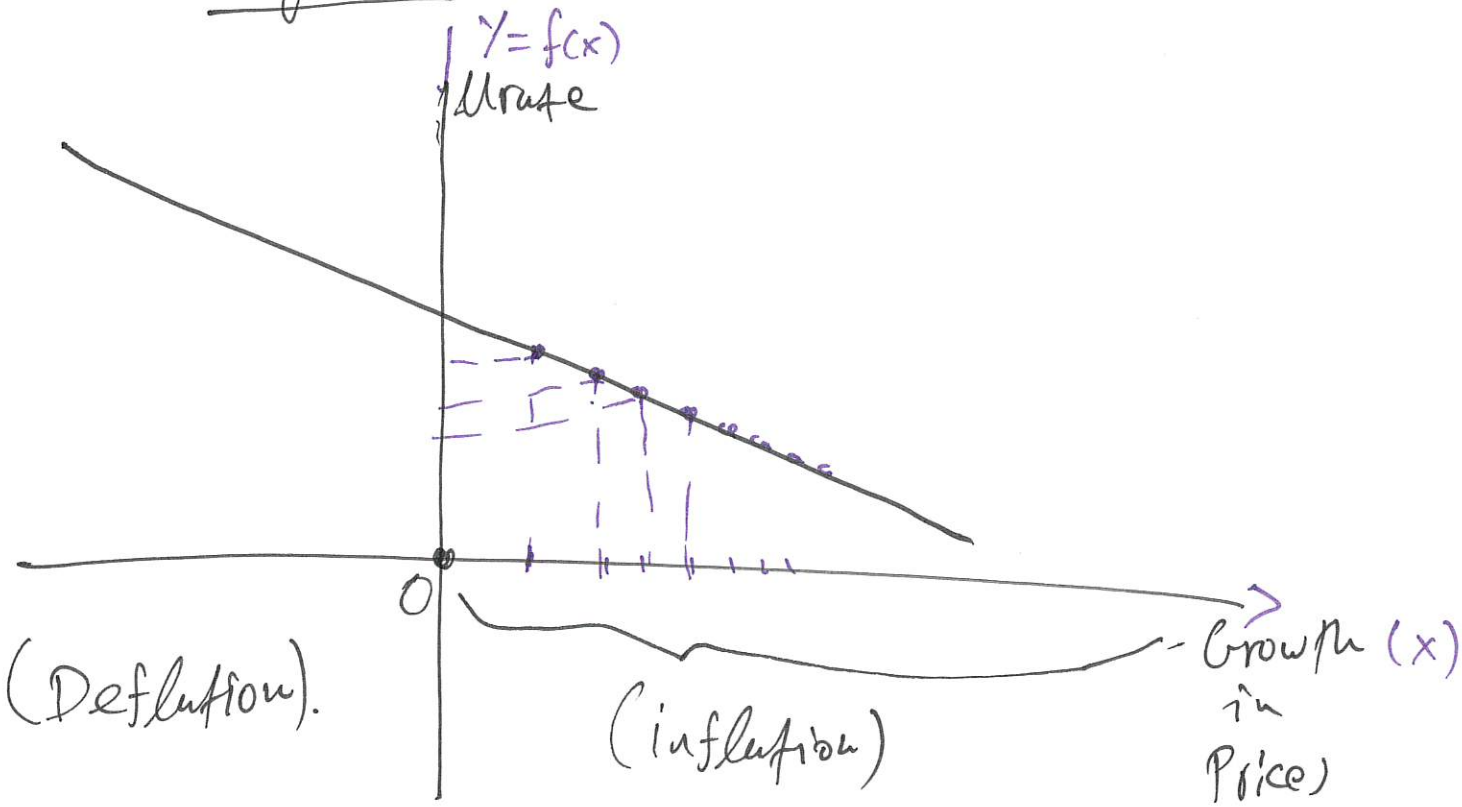
② CPI.

Change Inf. Rate → $\dfrac{P_t - P_{t-1}}{P_{t-1}}$

Phillips Relation:

(growth in P_t)

Urate and the change in P_t are **negatively** related.



Chapter 3: Goods Market

- Short-run model of the Economy.

- Assumption: $\boxed{Y = Z}$ where: Y: Domestic Production of Goods

(eqm. Condition)

Z: Domestic Demand for Goods.

- Assumption: Closed Economy: Imports = Exports = $\emptyset$

- Assumption: In the short-run, output is driven by demand (Z)

- Assumption: $\left.\begin{array}{l} Z = C + I + G \\ Y = Z \end{array}\right\} \Rightarrow$

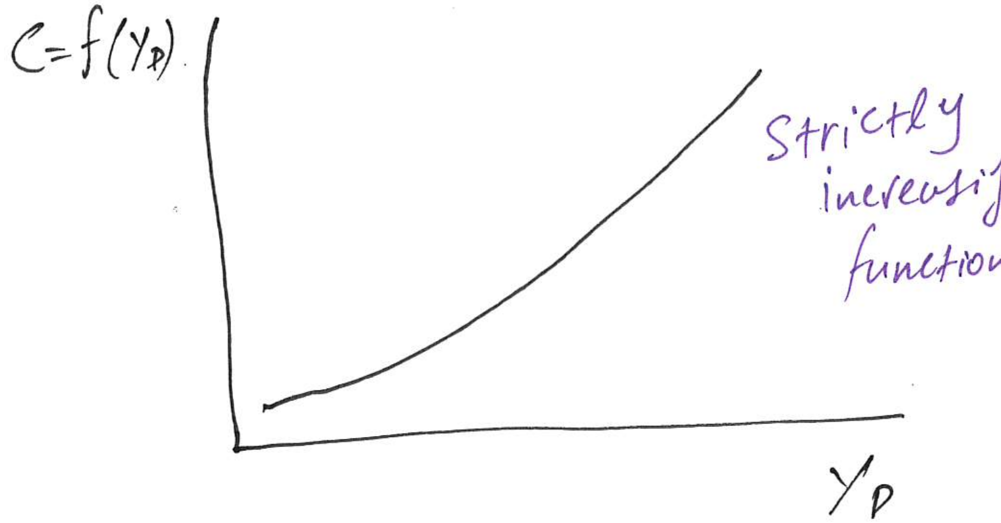
$$\boxed{\underbrace{Y}_{\text{Supply}} = \underbrace{C + I + G}_{\text{Demand for goods.}}}$$

Eqm. Condition.

Consumption Function: $C = f(Y_D)$:

Assumption: f is increasing in Y_D $\rightarrow$ C and Y_D are positively related.

$$\left(\frac{df(Y_D)}{dY_D} > 0 \text{ for all } Y_D \right)$$



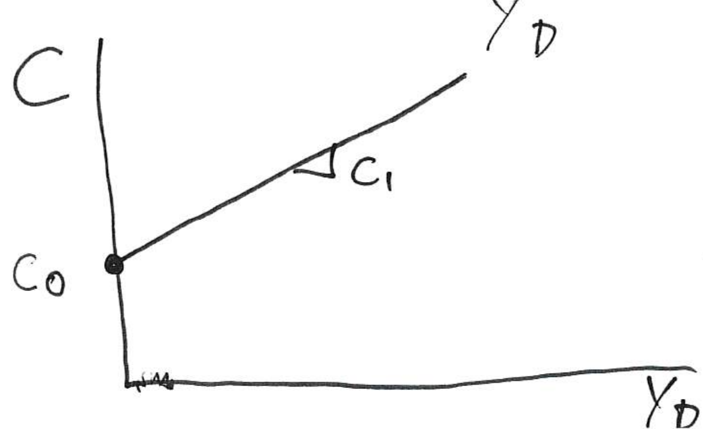
Assume f is linear in Y_D

$$C = c_0 + c_1 \cdot Y_D$$

where $c_0 > 0$ constant

c_1: Marginal Propensity to consume > 0

$$\Rightarrow C = c_0 + c_1 \underbrace{(Y - T)}_{Y_D}$$



c_1: MPC

↳ if $Y_D \uparrow$ by 1 unit $C \uparrow$ by c_1 units

- if $Y_D \uparrow$ by X units then $C \uparrow$ by $c_1 \cdot X$ units.

Assumption: $0 < c_1 < 1$. E.g $\underline{c_1 = 0.6}$

Marginal Propensity to Save:

$$1 - MPC = 1 - c_1 \xrightarrow{eg} 1 - 0.6 = \underset{\substack{\uparrow \\ MPS.}}{0.4}$$

Homework: Plot C as a function of Y for constant values of T.

$C(Y,T)$, and $C(T)$ for constant Y. ?

Plug $C(Y_D)$ in eqm condition:

$$Y^* = \underbrace{\underbrace{c_0 + c_1(Y^* - T)}_{C} + I + G}_{\text{Demand.}} \Rightarrow$$

→ The equality determines Y in the SR.

Y^*: Level of eqm output in our closed economy.

$$\Rightarrow Y^* = c_0 + c_1 \cdot Y^* - c_1 \cdot T + I + G$$

$$\Leftrightarrow Y^* - c_1 \cdot Y^* = c_0 - c_1 \cdot T + I + G$$

$$\Leftrightarrow Y^*(1 - c_1) = c_0 - c_1 \cdot T + I + G$$

$$\Leftrightarrow Y^* = \underbrace{\left(\frac{1}{1-c_1}\right)}_{\text{Multiplier}} \cdot \underbrace{\left[c_0 - c_1 \cdot T + I + G\right]}_{\text{Autonomous Spending}}$$

$\left(\frac{1}{1-c_1}\right) > 1$ Since $0 < c_1 < 1$

$m > 1$:

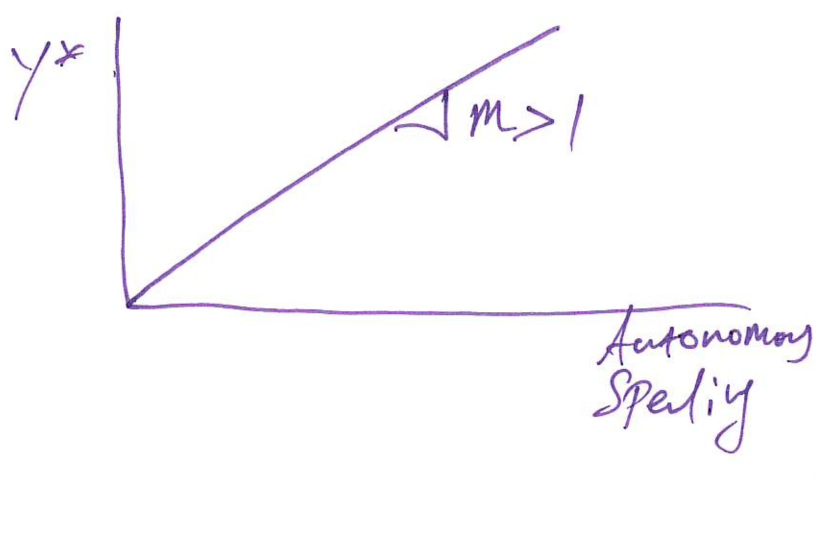
$Y = a \cdot X$

$$Y^* = m \cdot [A_s]$$

* linear function $Y = f(A_s)$

if $A.s \uparrow$ by 1 unit
then $Y^* \uparrow$ by m units

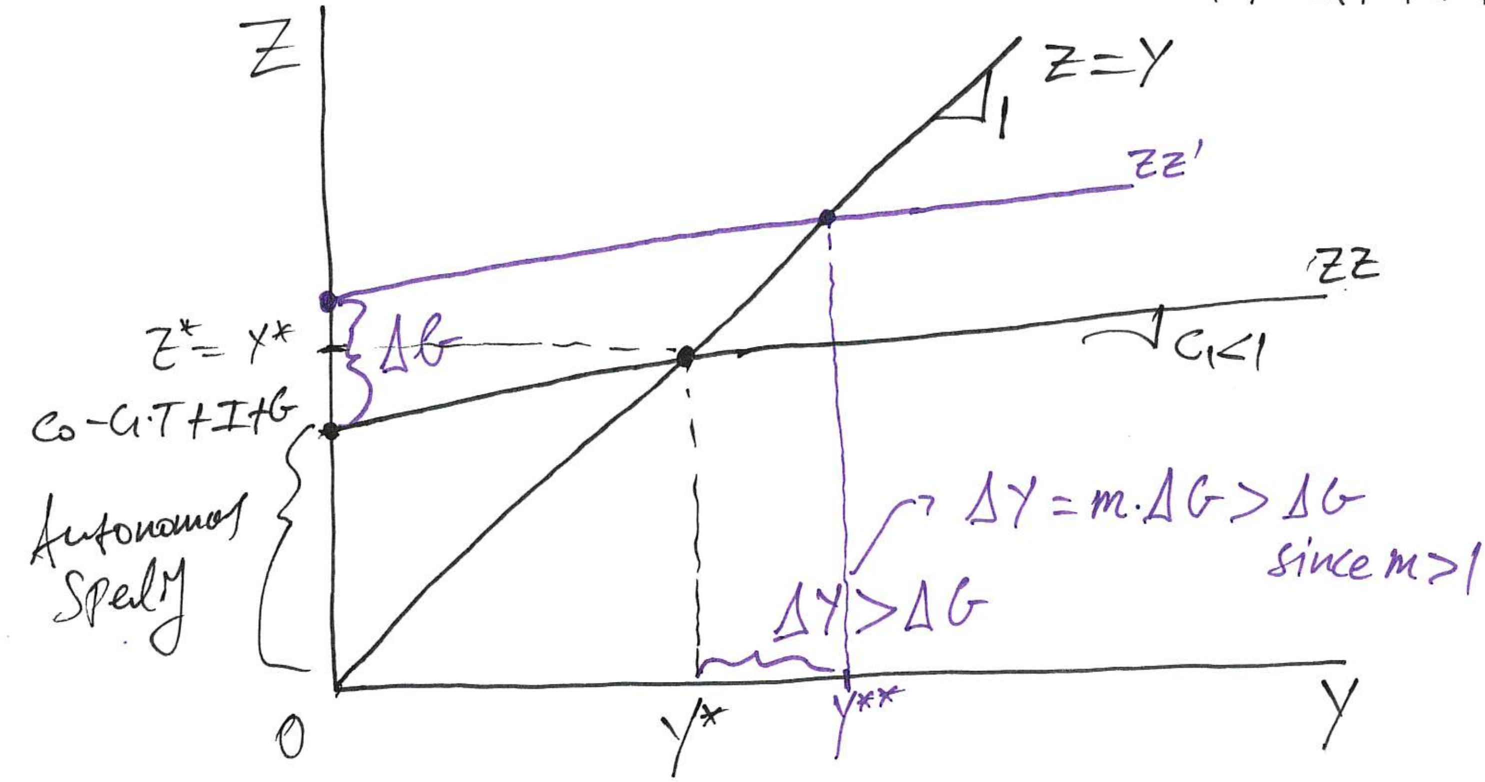
if MPC $\uparrow \Leftrightarrow$
$\Leftrightarrow c_1 \uparrow$
<u>then</u> $m \uparrow$



Graphically:

① EQM Cond: $Y = Z$

② $Z = C_0 + C_1 \cdot Y - C_1 T + I + G$



$$Z = \underbrace{\left[C_0 - C_1 \cdot T + I + G\right]}_{\text{intercept}} + \underbrace{C_1}_{\text{slope}} \cdot Y$$

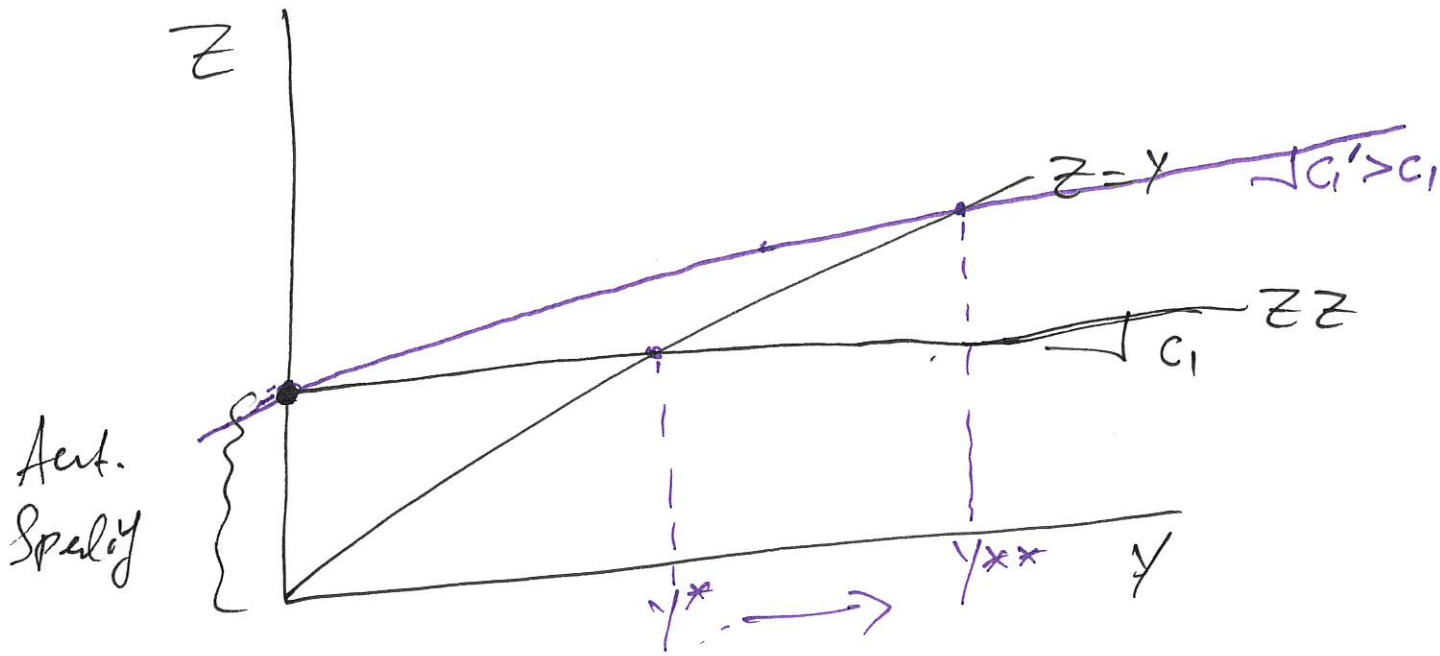
intercept = Autonomous Spending!

Effects of increase in G? ZZ shifts up to ZZ' by ΔG (the increase in G)

⊗ if $T \uparrow$ by 5 units

Aut.-Exp. goes down by $c_1 \cdot 5$: less than 5 units.

Tax Multiplier: $-c_1 \cdot m$.



Suppose T chnge by ΔT

eg $\Delta T = -5$.

Then chnge in Aut. Expenditure is

$-c_1 \cdot \Delta T$, eg: $\Delta A_{EXP} = -c_1 \cdot (-5)$

$= c_1 \cdot 5 < 5$

ZZ curve shifts up by $c_1 \cdot 5$ units.

$c_1 \uparrow$: ZZ curve becomes steeper

$\rightarrow Y^*$ increases.