Chapter 5:

exogenous variable -> model -> endogenous variables.

government budget constrain is satisified when

government spending (G) = tax revenue (T).

$G > T \Rightarrow$ deflict

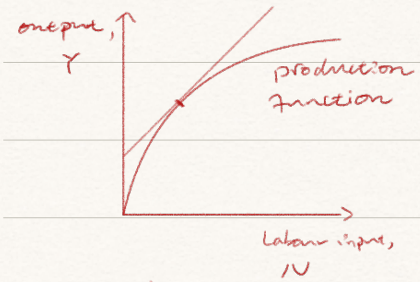
$G < T \Rightarrow$ surplus

in a competitive equilibrium, GDP(Y) = Consumption(C) + Gov spent(G)

the production function $Y = zF(K, N)$

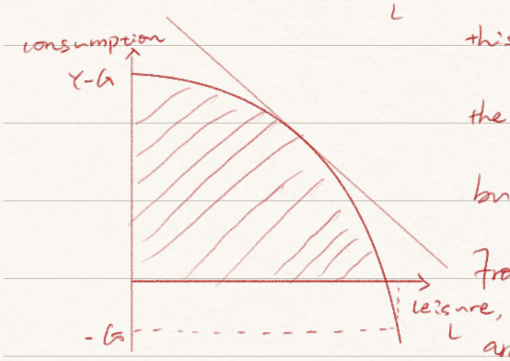
z is Total Factor Productivity, or the level of technology

K -> capital N -> labour

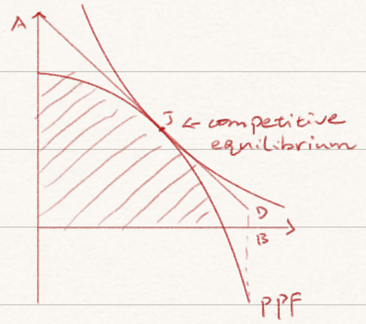


slope of the production is the marginal production of labours.

the relation is the mirror of production function



this is production possibility frontier (PPF), the shaded area is the technological fesiable bundle in this economy. The curve is get from shifting Y-L curve down with the amount of government expenditure



J is the equilibrium consumption bundle

ADB is consumer's budget constrain line, the slope of which is the negative of real wage, DB is the after-tax divident income

So, we have: $MRS_{L,C} = MRT_{L,C} = MP_N$

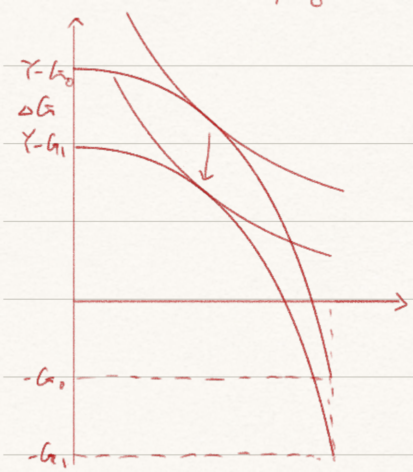
marginal rate of substitution = marginal rate of transformation = marginal production

at point J, the Perato Equilibrium achieved, that is, the indifference curve tangent to PPF

competitive equilibrium $\underset{\text{Second}}{\overset{\text{First}}{\rightleftarrows}}$ Pareto optimal

at pareto optimum, equilibrium real wage = - slope of PPF

Ex: what if government spending increase? (G↑)

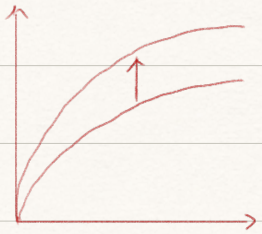


C↓ L↓ w↓ Y↑ this is an income effect

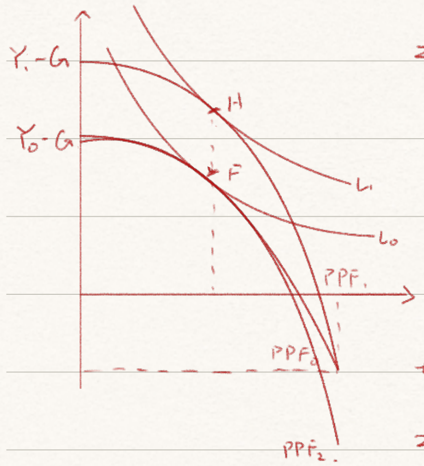
G↑ => PPF shift down => consumption curve shift down => w↓ C↓ L↓

employment rise, output (C+G)↑

Ex2. increase in z (tech factor)



an increase in z would shift up the production function, and $MP_N \uparrow$ (slope of the curve)



$z \uparrow \Rightarrow Y = z(K, N) \uparrow \Rightarrow Y = C + G$, G is fix, $C \uparrow$

$\Rightarrow$ real wage $\uparrow$

Leisure may rise or fall, employment is

$N = h + L$, employment may rise or fall

total available time — hours of work.

$z \uparrow$ is both an income effect (shifting curve)

and a substitution effect (moving along curve)

as we shift PPF_1 to get a tangent point with L_1, we get a new intersection, that's the substitution effect.

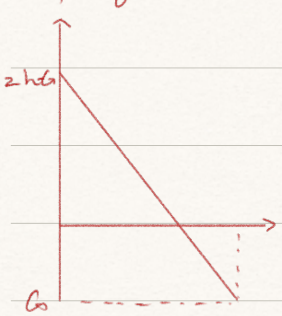
production function without capital : $Y = zN$ wage rate $\times$ labor

PPF: $C = z(h - L) - G$ $(C = Y - G,\ Y = zN = z(h - L))$

Consumer's Budget constrain: $C = w(1-t)(h-L) + \pi$ income not from labour

Profit for the firm: $\pi = Y - wN^d = zN^d - wN^d = (z - w)N^d$

if equilibrium: $C = z(1-t)(h-L)$

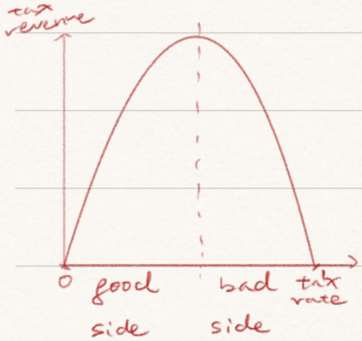


wage rate $\times$ share of after-tax income $\times$ hours spend on work.

this is a simplified PPF model, so the consumption is equal to $Y - G = zh - G$

Leisure as a function on tax rate

revenue for the government given tax rate t: $REV = tz(h - l(t))$



Laffer curve: if $t = 0$, $REV = 0$

$t = 1$, $REV = 0$ since no one work.

Keynes General Thory: price and wage are sticky since:

costs associated with decision-making to change wages or prices,

the evidence is that price and wages change infrequently.

P: price of good in terms of money

W: price of labour in terms of money (nomial wage)

$w = \frac{W}{P}$ real wage

in a short run: W is fixed (exogenous)

P could be adjusted by government:

$G\uparrow \Rightarrow P\uparrow \Rightarrow$ demand for good $\uparrow$

efficient output when: $MRS_{l,c} = MP_N = \frac{W}{P}$

if $MRS_{l,c} < MP_N$: consumer would like to work more to consume more

$>$ less.

in general the competitive equilibrium is not Pareto optimal,

the 1st welfare therom fails.

in a short run, if $MRS_{l,c} < MP_N = \frac{W}{P}$, government should increase

P. lower real wage, increase output. vice versa

increasing G could have a more than 1 increase in Y.