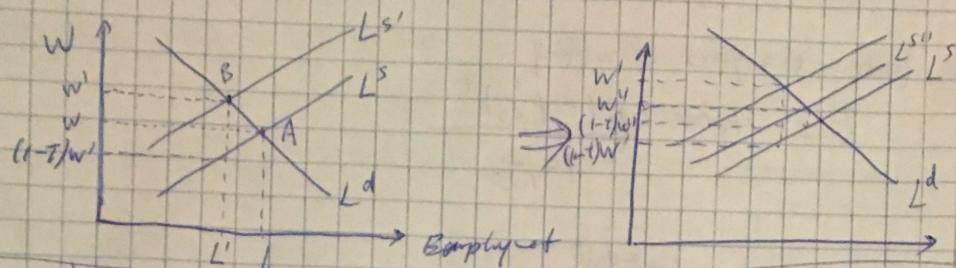


# 110A HW

Chp 7: (3) Reduction in income tax will decrease the wage, and decrease labor supply. so that employment-population ratio decreases. So unemployment will rise.



(4) Price decline by \$5 cause a decrease in wage, since there is lower price and potential loss profit to pay workers, and labor demand decreases; employment-population ratio decreases; increase in unemployment.

(5)

$$1.03 \cdot x = 5000, \Rightarrow x = 5000 / 1.03 = 4854$$

$$1.03^{10} \cdot x = 5000 \quad x = 5000 / 1.03^{10} = 3720.27$$

$$100 / 0.03 = 3333.\overline{3}$$

$$(100 / 1.03) / 0.03 = 3236.25 \quad e) \quad 100 / 0.03 = 3333.\overline{3}$$

(8)

$$W_t = 50000 (1.02)^t$$

$$W_{\text{discont}} = W_t / (1+R)^t$$

$$W_{\text{discont}} = 50000 \left( \frac{1.02}{1+R} \right)^t$$

$$b) \sum_{t=0}^{45} 50000 \left( \frac{1.02}{1+R} \right)^t = 50000 + 50000 \frac{1.02}{1+R} + 50000 \left( \frac{1.02}{1+R} \right)^2 + \dots + 50000 \left( \frac{1.02}{1+R} \right)^{45}$$

$$c) pdv = 50000 \left[ 1 + \frac{1.02}{1+R} + \left( \frac{1.02}{1+R} \right)^2 + \left( \frac{1.02}{1+R} \right)^3 + \dots + \left( \frac{1.02}{1+R} \right)^{45} \right]$$

$$\alpha = \frac{1.02}{1+R}$$

$$d) R = 0.04, \alpha = 0.9807$$

$$R = 0.03 \quad pdv = 50000 \frac{(1 - 0.9902946)}{1 - 0.9807} = 1530231.408$$

$$R = 0.02 \quad \alpha = 1 \quad pdv = 50000 \cdot 0 = 0$$

if  $R = 0.02, \alpha = 1$  then geometric series formula won't work as  $(1-\alpha)^{n+1} = 0$  so  $pdv = 0$ . However ~~pdv~~ should equal to  $50000 \times 45$

Chp 7 (8) when  $R = 0.04$  pdv is about 30 times of  $W_0$

e) when  $R = 0.03$  pdv is about 36 times of  $W_0$

when  $R = 0.02$ , then pdv is equal to the  $W_0 \cdot t$

(9)

a) denote  $t =$  years of working

$$I = 40000 \cdot \frac{1 - \left(\frac{1}{1.03}\right)^t}{1 - \frac{1}{1.03}}$$

b)  $I = 70000 \cdot \frac{1 - \left(\frac{1}{1.03}\right)^t}{1 - \frac{1}{1.03}} - 80000$

c) The economic value of college education far exceed the cost, so having a college education is beneficial as it significantly increase ~~the~~ labor incomes.

(11) ~~Reform~~

a) For: ensure the ~~workless~~ unemployed workers to take more time looking for jobs without stressing about the income

Against: this reform will not encourage ~~workless~~ unemployed workers to get employed potentially decrease labor supply and increase or prolong unemployment.

b) For: this urge people to find a job within 10 weeks while reward people who can find a job relatively fast (so it can be a encouragement for finding jobs).

Against: potential loopholes can be exploited by people who quit jobs and find a new one really soon; furthermore 10 weeks of payment might be not enough especially for people who cannot budget their spending.

(Chp 17)

② a)  $R \geq (1-t)MPK - d + \frac{\Delta P_K}{P_K} = (1-0.25)$

$$\text{user cost of } K = MPK = R + d - \frac{\Delta P_K}{P_K} = \frac{0.02 + 0.07 - 0.02}{0.75} \approx 0.147$$

b)  $\text{user cost of capital rise by } \frac{0.07}{0.75} = 0.0933$ , user cost of capital rise by ~~percent~~ 2.63%

c) if  $t = 0$   $MPK_{R=0.02} = 0.11$ ,  $0.173 - 0.147 = 0.0263$

increase in corporate tax will increase the user cost of  $K$ , the increase in real interest rate will also ~~not~~ increase the user cost of capital which decreases investment rate  $= R$

## Chap 17

(5)

$$a) MPK = \frac{R+d}{(1-ITC)} \cdot \frac{(R+d)(1-ITC)}{(1-\tau)}$$

$$b) \frac{R+d}{(1-ITC)} = \frac{R+d}{0.9} \cdot \frac{(R+d)(1-ITC)}{(1-\tau)} = \text{user cost of capital} = \frac{0.9(R+d)}{(1-\tau)}$$

c) if  $\tau = ITC$   $(1-ITC) = (1-\tau)$ , the user cost of capital =  $R+d$

because the income tax credit and the corporate income tax will cancel each other out.

(8)

$$a) \text{stock price} = \frac{\text{dividend}}{\text{interest rate} - \text{capital gain}} = \frac{\text{dividend}}{R - \frac{\Delta P_s}{P_s}}$$

Interest rate	Growth rate	Stock price
4	0	250
4	2.0	500
4	3.0	1000
4	3.9	10000
6	0.	166.6
6	2.0	250
6	5.0	1000

b) The stock price gets very high, because if interest rate and growth rate of dividend gets close that means the dividend will be very little given a fixed stock price, so if the dividend is fixed, then the stock price needs to get very high to maintain the dividend.

c)

$$\frac{P_s}{\text{earnings}} = \frac{\text{dividend}}{\left(R - \frac{\Delta P_s}{P_s}\right) \text{earnings}} \quad \text{as gap between } R \text{ & } \frac{\Delta P_s}{P_s} \text{ narrows,}$$

the P/E ratio can be very volatile, so a stock price can be very high while the earning is not high resulting high P/E ratio or a financial bubble.

(9)

Grwth rate of Phase	Dowpayment rate	Price of -th (end of)
0	20	7462.69
2	20	8771.93
5	20	11904.76
10	20	29411.76
5	100	10000
5	10	12345.68
5	5	12345.68

$$P_{\text{Phase}} = \frac{\text{Rent}}{\tau \cdot \frac{P}{P} \cdot R + (1-\tau)R + d - \frac{\Delta P_{\text{Phase}}}{P_{\text{Phase}}}}$$

$$= \frac{1000}{0.4 \cdot \frac{P}{P} \cdot 0.05 + (0.6)0.05 + 0.1 - \frac{\Delta P}{P}}$$

## Chpt 7

- ⑨ b) The ~~condo~~ condo price is very sensitive to the expected capital gain (little change in price growth rate can significantly change the price)
- c) However, the condo price is not very sensitive to down-payment rate changing.

(10)

$$P_i \cdot R = \text{Prof} + \Delta P_i$$

a)  $R = \frac{\text{Prof}}{P_i} + \frac{\Delta P_i}{P_i}$

b)  $P_i = \frac{\text{Prof} + \Delta P_i}{R}$   
 $= \frac{\text{Prof}}{R - \frac{\Delta P_i}{P_i}}$

c) The price of the patent equals to the profit of owning the patent divided by the difference between interest rate and the rate of the patent price changing.