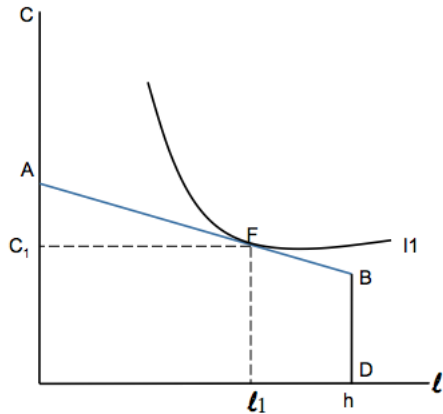
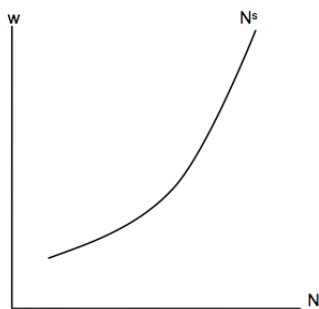


Ch.7 A Closed Economy One-Period Macroeconomic Model : Part 1. Optimizing Agent Decision

1. Consumer optimization

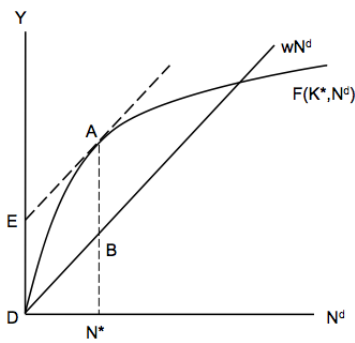


- Utility Function :  $U = U(C, \ell)$
- Budget constraint :  
 $C = \dots\dots\dots$   
 $C + w\ell = \dots\dots\dots$
- An increase in  $\pi - T$   
 $w \uparrow \Rightarrow$  Income Effect  $\Rightarrow$  wage income.....  $\Rightarrow$  income  $\uparrow$   
 $\Rightarrow$  Substitution Effect  $\Rightarrow$   $\ell$  becomes relatively more expensive  
 $\Rightarrow$   $C, \dots, \ell, \dots$

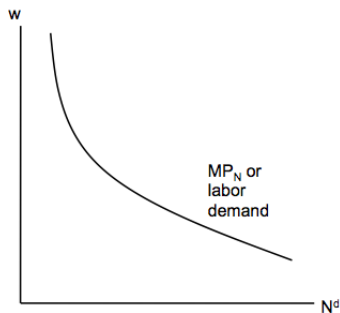


- Labor supply function  $N^s(w) = h - \ell(w)$
- $w \uparrow$  (keeping non-wage income  $(\pi - T)$  constant  $\Rightarrow \ell \downarrow$  (stronger substitution effect)  $\Rightarrow N^s \uparrow$ )  
 - As non-wage income  $(\pi - T)$  increases,  $\ell \dots\dots$  for all levels of real wage (a pure income effect). As a result,  $N^s \dots\dots$  for all levels of wage.

2. Firm Profit Maximization



- $Y = zF(K, N^d)$  ;  
 -  $\frac{\partial Y}{\partial K} = \frac{\Delta Y}{\Delta K} = MP_K \dots\dots 0$ ,  $\frac{\partial Y}{\partial N} = \frac{\Delta Y}{\Delta N} = MP_N \dots\dots 0$  ; upward sloped  
 -  $\frac{\partial^2 Y}{\partial^2 K} \dots\dots 0$ ,  $MP_K \dots\dots$  as  $K \uparrow$  ; concave  
 -  $\frac{\partial^2 Y}{\partial^2 N} \dots\dots 0$ ,  $MP_N \dots\dots$  as  $N \uparrow$  ; concave  
 -  $\frac{\partial Y}{\partial K} = z \frac{\partial F}{\partial K}$ ,  $\frac{\partial Y}{\partial N} = z \frac{\partial F}{\partial N}$



- $Y = zF(K, N^d)$  ; diminishing returns and constant returns to scale
- Profit maximization condition :  $\pi = zF(K, N^d) - wN^d$   
 $MP_N = w$ . The  $MP_N$  is the firm's labor demand curve.
- As  $w \uparrow$ , Max profit :  $MP_{N^*} = w$ ,  $MP_{N^*} \uparrow$ ,  $N^* \dots\dots$
- As  $w \uparrow$ ,  $N^d \dots\dots$
- Profit-max: the firm hires labor up to the point where  $MP_N = w$ .
- What will happen to  $N^d$  if  $z \uparrow$ ? What will happen to  $N^d$  if  $K \uparrow$  or  $z \uparrow$ ?

3. Government Budget Constraint :  $G = T$