

# Chapter 3

Economics, Macroeconomics



Chapter 3 Assumptions of firms about labor market 1. Workers are all alike 2. Wages are set by the market 3. Firm's goal is to earn the highest possible profit

Wages = cost of an extra worker The firm will hire until (value of extra worker = wage)

Production Function  $A =$  productivity Marginal product of labor (MPN) MPN decreases as #workers inc. The benefit of employing an additional worker in term of the extra output produced. Marginal revenue product of labor (MRPN =  $P \times MPN$ ) Benefit of employing an additional worker in terms of the extra revenue produced  $MRPN > Wage$  to make a positive profit

$w$  (real wage) =  $W$  (nominal wage) /  $P$  (output price)  $MPN > W$  hiring more workers is profitable A decrease in real wage raises the amount of labor demanded  $MPN = wage$  (profit maximization) Labor Demand curve = same as MPN curve Vertical axis — real wage Horizontal axis — labor demanded  $\Rightarrow$  quantity of labor decreases as LD curve not shifted by change in real wage Shifted by supply shock, change in capital stock A beneficial supply shock raises the MPN at all levels of labor input. Labor demand is determined by firms Labor Supply and Real Wages

- \* Substitution effect of a higher real wage : workers work more when rewarded highly  $\rightarrow$  work more : pure substitution effect  $\rightarrow$  one day rise in the real wage
- \* Income effect of a higher real wage : workers become wealthier with higher income  $\rightarrow$  work less : pure income effect  $\rightarrow$  increase in wealth
- \* Both: a long term increase in real wage

Labor Supply Curve Relationship between labor supplied and real wage Labor Market Equilibrium Full employment is occurred when  $ND = NS$  Temporary adverse supply shock Ex. Bad weather Decreases MPN at every level  $\Rightarrow$  decreases ND Because it is temporary, it doesn't affect future marginal product or future real wage  $\Rightarrow$  labor supply curve does not move Full

Employment Output Potential output The level of output that firms supply when wages/prices have fully adjusted  $Y = AF(K, N)$  \* For constant capital stock,  $K$ , full employment is determined by  $N$ , level of employment, and the production function. \* Adverse supply shock lowers  $Y$ , by reducing the quantity of output with fixed amounts of capital and labor \* Reduction in productivity measure,  $A$  \* Adverse supply shock lowers  $N$  and thus employment level  $N$  and  $Y$ . Unemployment Labor force = employed + unemployed Population = labor force + not in labor force Unemployment spell \* the period of time an individual is continuously unemployed \* duration: the length of time the spell lasts Why unemployment? 1. Frictional unemployment \* workers search for suitable jobs and firms search for suitable workers \* dynamic economy 2. Structural unemployment - chronically unemployed for a long term a. unskilled workers can't find desirable long term jobs because of factors such as - inadequate education, discrimination, language, etc. b. reallocation of labor from shrinking to growing industries Cyclical Unemployment = Actual unemployment rate — natural unemployment rate ( $u - u_n$ ) + when economy's output and employment are below full employment levels - when output and employment exceed full employment levels Okun's Law - The gap btw and economy's full employment output and its actual level of output increases by 2% for each % the unemployment rate increases  $(Y - Y_f)/Y_f = -2(u - u_n)$   $(Y - Y_f)/Y_f$  : amount by which  $Y$  falls short of full employment output the percent gap equals 2 times the cyclical unemployment rate. Ex. If  $(u - u_n) = 1\%$ , actual output,  $Y$ , is 2% lower than full employment output  $Y_f$ .  $Y_f = 15\text{bil}$ ,  $Y$  is \$300 below the full employment level.  $(15\text{bil} \times 2\%) = 300$   $\hat{Y}/Y_f = -2\hat{u}$   $\hat{u}$  (growth rate

form of Okun's Law)  $\hat{Y} = -\beta \Delta u + \gamma$  where  $\hat{Y}$  = percent growth rate of output  $\Delta u$  = change in actual unemployment rate. When unemployment is rising, actual output,  $Y$ , is growing more slowly than 3% per year (average growth rate of full-employment output in the U. S.). The equation assumes that the natural rate of unemployment is constant.