ECONOMICS 3020: Accelerated Macroeconomics

Baker Laboratories 119

MWF 10:10 AM - 11:00 AM
Chapter 3.

Readings

Chapter 3.
Two Measures of Inflation
Real versus Nominal Interest Rate

Real interest rate is equal nominal interest rate minus inflation rate.

\[ r = i - \frac{P(t+1) - P(t)}{P(t)} \]

\[ \frac{P(t+1) - P(t)}{P(t)} \] is the inflation rate

Real interest rate measures the change in the real value, i.e. purchasing power of an interest bearing asset.

Why is it relevant? You tell me…
MPL and the Demand for Labor

Each firm hires labor up to the point where $MPL = \frac{W}{P}$.

- Units of output vs. Real wage
- MPL, Labor demand vs. Units of labor, $L$
- Quantity of labor demanded

$MPL = \frac{\text{Marginal Product of Labor}}{\text{Price of Labor}}$
We have just seen that MPL = W/P

The same logic shows that MPK = R/P:

- Diminishing returns to capital: MPK ↓ as K ↑
- The MPK curve is the firm’s demand curve for renting capital.
- Firms maximize profits by choosing K such that MPK = R/P.
Firm’s production function is

\[ Y = F(K, L) \]

Firm’s inputs are capital and labor, thus

Profits = Revenue – Costs

Profits = \( P \cdot F(K, L) - R \cdot K - W \cdot L \)

Firm’s objective is to maximize profits
Thus, the firm’s problem is

\[
\text{max } P \cdot F(K,L) - R \cdot K - W \cdot L
\]

The solution to this problem requires

\[
P \cdot \frac{\partial F(K,L)}{\partial K} = R
\]
\[
P \cdot \frac{\partial F(K,L)}{\partial L} = W
\]
Under the assumption of constant returns to scale, the Firm’s Production Function and Economy Wide Production Function coincide; the Solution to Firm’s Maximization Problem dictates the EQUILIBRIUM relationship between factor prices (i.e. rental rate on capital and wages) and factor demand.
Labor Market Equilibrium

Labor Market, as any other is given by two sides: Supply and Demand.

• Demand as we saw comes from Firms.

• The supply side is determined by the Households.

• The labor market is in equilibrium when wages are such that the demand of labor is equal to supply.
The only last piece we need to have a well defined problem is to know how does labor supply change when wages change.

Which one makes sense?

a) Labor Supply falls when wages rise;
b) Labor Supply rises when wages rise;
c) Labor Supply does not change when wages rise.
Labor Market Equilibrium

All three make sense, BUT ON AGGREGATE LEVEL, empirics strongly suggests that labor supply rises when wages rise.
Assumptions about Happy Times

The economy’s supplies of capital is at social optimum and everybody who wants to work, finds a job

\[ K = \bar{K} \quad \text{and} \quad L = \bar{L} \]
The Output (GDP) in Happy Times

Output is determined by the fixed factor supplies (assuming the state of technology $A=1$ is fixed)

$$\bar{Y} = F(\bar{K}, \bar{L})$$
Most importantly, not everybody who wants a job has a job: there is no unemployment.

So... does this mean that labor market is not in equilibrium?
Can be divided into a few categories

**Frictional Unemployment:** (the studies of this have given the beginning of so called SEARCH THEORY. Why?)

**Structural Unemployment:** people whose skills are inadequate or currently redundant.
During the Great Depression unemployment peaked at 35%. Unemployment has hovered around 9% during the current recession.

"Full employment" is often taken to be 4% to 5% for the US. Why isn't it 0%? Would a 0% rate be desirable?
Dale Mortensen, Northwestern
Edmund Phelps, Columbia
Randall Wright, Wisconsin
U.S. Unemployment, 1958-2002

The graph shows the percent of labor force over the years from 1955 to 2000. There are two lines represented: one for the unemployment rate and another for the natural rate of unemployment. The unemployment rate fluctuates significantly over the years, reaching a peak around 1980, while the natural rate of unemployment shows a more gradual increase over the same period.
First, need to define something nobody has a real clue about: natural rate of unemployment.

Second, analyze the relationship between changes in output and deviations of unemployment rate from natural rate of unemployment by looking at the historic data.
Natural rate of unemployment: the average rate of unemployment around which the economy fluctuates.

In a recession, the actual unemployment rate rises above the natural rate.

In a boom, the actual unemployment rate falls below the natural rate.