

The Labor Market

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Issues

- ▶ We move from the short run to the medium run
- ▶ Short run:
 - ▶ supply is elastic; we don't have to worry about it
 - ▶ only demand matters
- ▶ Medium run: supply depends on prices
 - ▶ price setting mechanisms push output towards trend
 - ▶ demand and supply matter
- ▶ Long run: output is on its trend growth path
 - ▶ only supply matters
 - ▶ capital stock is endogenous

Objectives

In this section you will learn:

1. how wage setting determines unemployment
2. how to set up the AS-AD model
3. how price adjustment pushes the economy towards the long-run trend growth path
4. how to analyze policies and shocks

Wage Determination: Walrasian Model

Wage Determination

- ▶ How wages are set determines
 - ▶ the level of unemployment
 - ▶ the adjustment path towards full employment
- ▶ We start with a standard Walrasian view
 - ▶ there is no unemployment
 - ▶ this approach is useful for the long run, but not for the medium run
- ▶ We then introduce the key labor market friction that generates unemployment

Labor Demand

- ▶ Firms hire labor until real wage equals marginal product of labor.
- ▶ The labor demand curve is the *MPL* curve.
- ▶ Example: $Y = \bar{A}K^\alpha L^{1-\alpha}$
 - ▶ $MPL = dY/dL = (1 - \alpha)\bar{A}K^\alpha L^{-\alpha}$.
 - ▶ The firm sets $w = MPL$.
 - ▶ Everything else (\bar{A}, K) equal, labor demand is downward sloping in L .
- ▶ What shifts labor demand?

Labor Supply

- ▶ We should derive labor supply from the household's decision how much to work / how much leisure to consume.
- ▶ For now, we just assume that higher wages are associated with more labor supply.

Labor Market Equilibrium

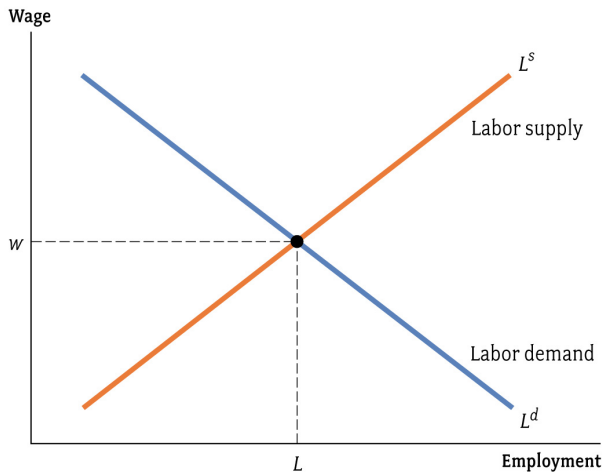


FIGURE 7.3 The Labor Market

Macroeconomics, Charles I. Jones
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Change in labor demand

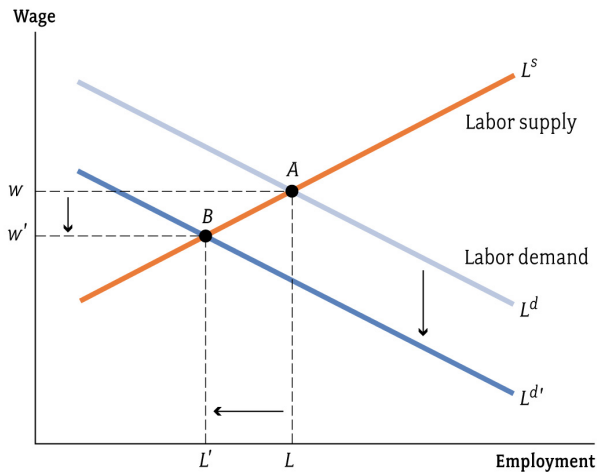


FIGURE 7.5 A Reduction in Labor Demand

Macroeconomics, Charles I. Jones
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Where is unemployment?

Which workers are unemployed?

In what sense?

Insight:

We are missing a friction that prevents workers from finding jobs.

Would measured unemployment be zero?

Insight

Unemployment is an arbitrary concept.

Caution when interpreting unemployment rates.

A Model With Frictions

The Story

The story in a nutshell

1. Inflation erodes the real wage.
2. At lower real wages, firms hire more labor.
3. Hence, employment is higher when inflation is higher

This requires **sticky wages**.

- ▶ Sticky prices would work as well (a different channel).

The Story

Wage bargaining sets **nominal wages** W for a period of time.

Workers aim for a certain **real wage** $W/P = w$.

- ▶ If “economic conditions” are good, the target W/P is high.

They have price expectation P^e and set $W = wP^e$.

Firms set employment based on the true W/P .

If price expectations are correct: $P^e = P \implies W/P = w$

- ▶ we get “full employment” (workers work as much as they want)
- ▶ that's the Walrasian outcomes

The Story

If workers get P^e wrong, the real wage deviates from w .

Notably: unexpected inflation implies $P > P^e$

The real wage is eroded

$$W/P = (W/P^e)(P^e/P) \quad (1)$$

$$= w(P^e/P) \quad (2)$$

$$< w \quad (3)$$

That induces firms to hire more (cheap) workers.

Unexpected inflation can stimulate the economy.

What Happens in the Model

The model (adapted from the text) contains a different version of the story (for simplicity).

Labor supply:

- ▶ $N^s(W/P^e)$ is increasing in the perceived real wage.

Labor demand:

- ▶ perfectly elastic at a fixed real wage $W/P = 1/(1+m)$.

Unexpected inflation increases W and thus W/P^e .

- ▶ Workers think the real wage is high.
- ▶ They supply more labor and employment rises.

Labor Supply

Labor supply:

$$N^s = \hat{F}(W/P^e, z) \quad (4)$$

z : labor market conditions

- ▶ unemployment benefits, taxes, etc

Key: N^s depends on the real wage evaluated at P^e (not P).

We assume that N^s is increasing in W/P^e .

Why Does Labor Supply Increase in the Wage?

1. Efficiency wages
2. Centralized wage bargaining
 - 2.1 labor unions bargain with employers
 - 2.2 their objective is to get the highest wage for the largest number of workers
3. Search and Matching
 - 3.1 if the unemployment rate is high, jobs are hard to find, but vacancies are easy to fill
 - 3.2 this gives firms bargaining power, which drives down wages

Labor Demand

Output is produced from labor only: $Y = N$

Marginal cost is constant at W .

Assumption: Firms set prices as a markup over marginal cost.

$$P = (1 + m)W \quad (5)$$

In general: marginal cost is an increasing function of wage W and employment N .

Implications:

1. the real wage is **fixed**:

$$W/P = \frac{1}{1 + m} \quad (6)$$

2. labor demand is **perfectly elastic** at this real wage

Labor Market Clearing

$$N = \hat{F}(W/P^e, z) \quad (7)$$

$$= \hat{F}\left(\frac{W}{P} \frac{P}{P^e}, z\right) \quad (8)$$

$$= \hat{F}\left(\underbrace{\frac{P}{P^e}}_{\text{mistake}}, \underbrace{\frac{1}{1+m}}_{\text{real wage}}, z\right) \quad (9)$$

Employment is increasing in P/P^e and z .

Model Summary

Production function

$$Y = N \quad (10)$$

Labor demand:

$$W/P = 1/(1+m) \quad (11)$$

Labor supply:

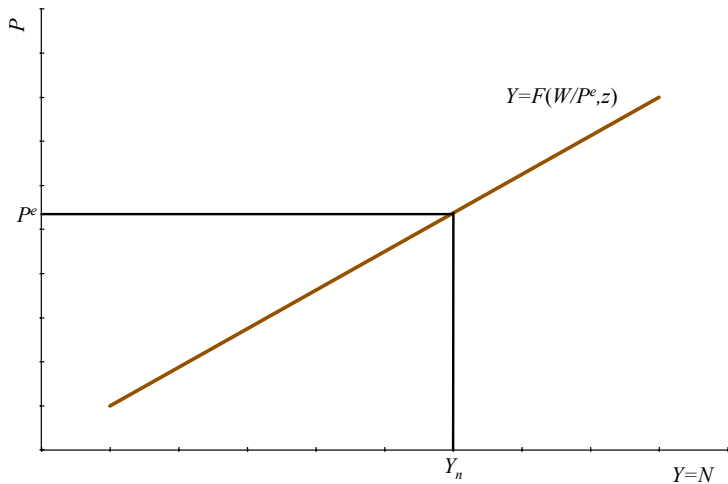
$$N^S = \hat{F}(W/P^e, z) \quad (12)$$

Labor market clearing:

$$Y = N = \hat{F}(W/P^e, z) \quad (13)$$

$$= \hat{F}\left(\frac{P}{P^e} \frac{1}{1+m}, z\right) \quad (14)$$

Summary



Intuition

Workers see a high nominal wage and think they see a high real wage.

So they supply more labor.

In reality, price setting by firms fixes the real wage

- ▶ Workers are wrong every time.

Until worker's price expectations adjust ($P^e \rightarrow P$), inflation affects employment.

Exercises

What happens to $Y = N$ when

1. price expectations are higher?
2. markups rise?
3. unemployment benefits improve?

Natural Rate of Unemployment

When price expectations are correct:

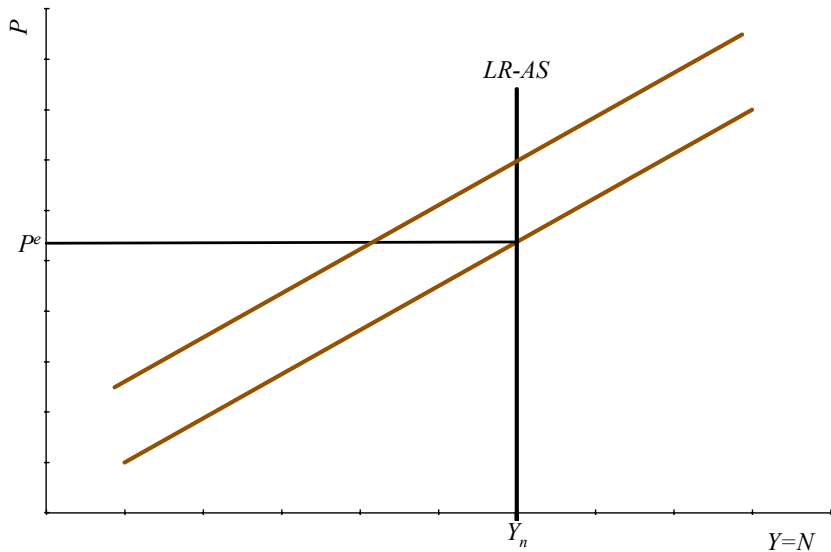
$$Y_n = N_n = F(1/(1+m), z) \quad (15)$$

This is the medium-run outcome.

The long-run supply curve is **vertical**

u_n is still affected by distortions to labor markets (z) and product markets (m).

Long-run Supply Curve



What's Next?

- ▶ If price expectations were always correct, we would be done:
 - ▶ markups and labor productivity determine the real wage
 - ▶ the real wage determines (un)employment
 - ▶ employment determines output
- ▶ This is what happens in the long run
 - ▶ only the supply side matters
- ▶ But what happens when $P^e \neq P$?

Reading

- ▶ Blanchard / Johnson, *Macroeconomics*, 6th ed, ch. 6

Further Reading:

- ▶ Jones, *Macroeconomics*, ch. 7.