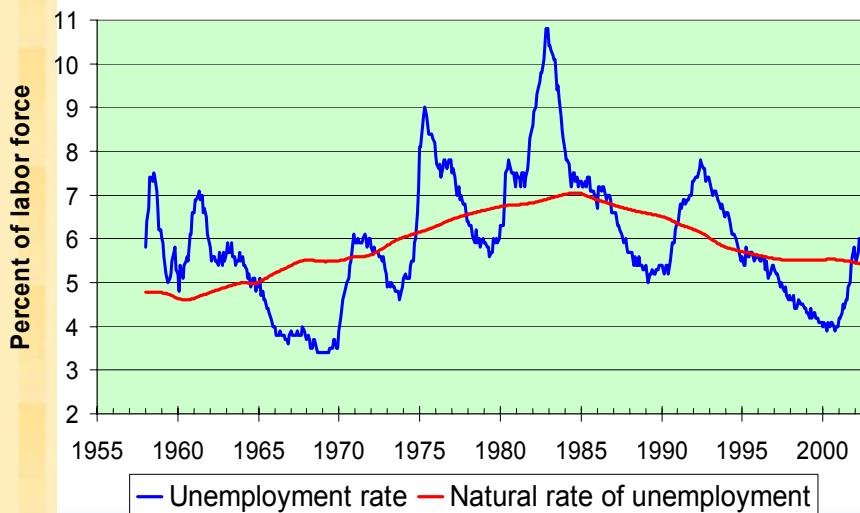


## Natural Rate of Unemployment

- **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.

CHAPTER 6 Unemployment

## U.S. Unemployment, 1958-2002



CHAPTER 6 Unemployment

slide 3

## A first model of the natural rate

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Notation:

$L$  = # of workers in labor force

$E$  = # of employed workers

$U$  = # of unemployed

$U/L$  = unemployment rate

## Assumptions:

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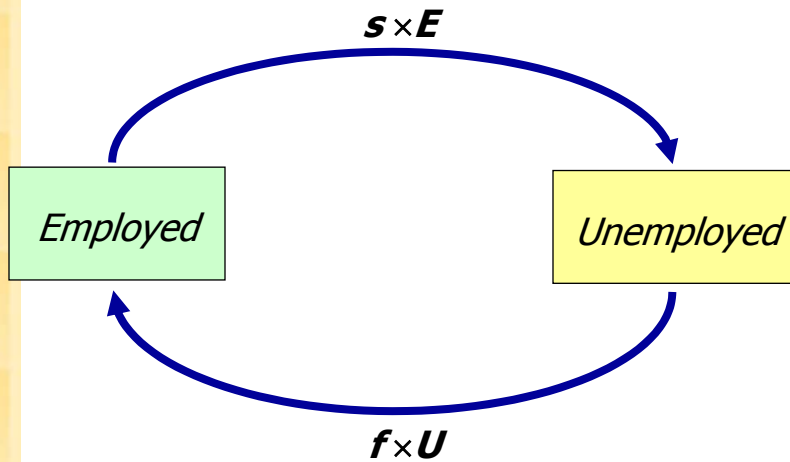
1.  $L$  is exogenously fixed.
2. During any given month,  
 $s$  = fraction of employed workers that become separated from their jobs,  
 $f$  = fraction of unemployed workers that find jobs.

$s$  = rate of job separations

$f$  = rate of job finding

*(both exogenous)*

## The transitions between employment and unemployment



## The steady state condition

- Definition: the labor market is in **steady state**, or long-run equilibrium, if the unemployment rate is constant.
- The steady-state condition is:

$$s \times E = f \times U$$

# of employed people who lose or leave their jobs

# of unemployed people who find jobs

## Solving for the “equilibrium” $U$ rate

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$$\begin{aligned}f \times U &= s \times E \\ &= s \times (L - U) \\ &= s \times L - s \times U\end{aligned}$$

Solve for  $U/L$ :

$$(f + s) \times U = s \times L$$

SO,

$$\frac{U}{L} = \frac{s}{s + f}$$

## Example:

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- Each month, 1% of employed workers lose their jobs ( $s = 0.01$ )
- Each month, 19% of unemployed workers find jobs ( $f = 0.19$ )
- Find the natural rate of unemployment:

$$\frac{U}{L} = \frac{s}{s + f} = \frac{0.01}{0.01 + 0.19} = 0.05, \text{ or } 5\%$$

## *policy implication*

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- A policy that aims to reduce the natural rate of unemployment will succeed only if it lowers  $s$  or increases  $f$ .

## *Why is there unemployment?*

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- If job finding were instantaneous ( $f = 1$ ), then all spells of unemployment would be brief, and the natural rate would be near zero.
- There are two reasons why  $f < 1$ :
  1. job search
  2. wage rigidity

## Job Search & Frictional Unemployment

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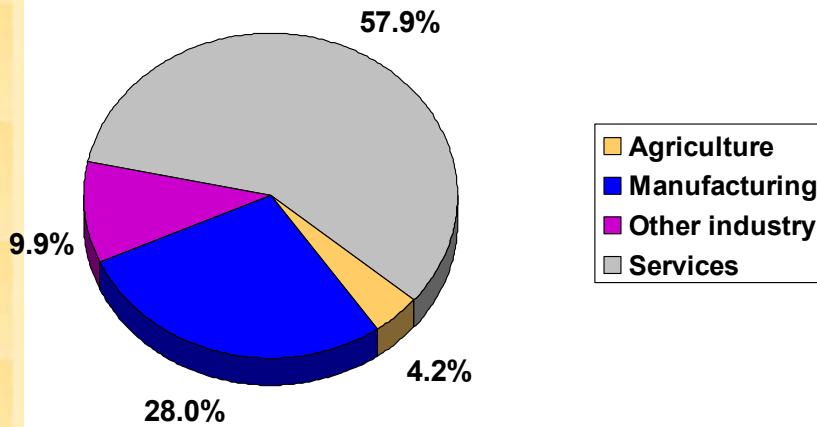
- **frictional unemployment:** caused by the time it takes workers to search for a job
- occurs even when wages are flexible and there are enough jobs to go around
- occurs because
  - workers have different abilities, preferences
  - jobs have different skill requirements
  - geographic mobility of workers not instantaneous
  - flow of information about vacancies and job candidates is imperfect

## Sectoral shifts

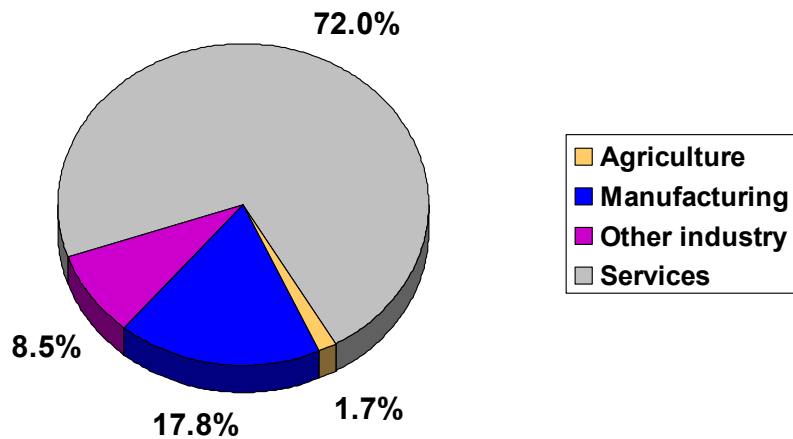
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- def: changes in the composition of demand among industries or regions
- *example:* Technological change increases demand for computer repair persons, decreases demand for typewriter repair persons
- *example:* A new international trade agreement causes greater demand for workers in the export sectors and less demand for workers in import-competing sectors.
- It takes time for workers to change sectors, so sectoral shifts cause frictional unemployment.

## Industry shares in U.S. GDP, 1960



## Industry shares in U.S. GDP, 1997



## Public Policy and Job Search

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Govt programs affecting unemployment

- *Govt employment agencies:*  
disseminate info about job openings to better match workers & jobs
- *Public job training programs:*  
help workers displaced from declining industries get skills needed for jobs in growing industries

CHAPTER 6 Unemployment

## Unemployment insurance (UI)

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- UI pays part of a worker's former wages for a limited time after losing his/her job.
- UI increases search unemployment, because it:
  - reduces the opportunity cost of being unemployed
  - reduces the urgency of finding work
  - hence, reduces  $f$
- Studies: The longer a worker is eligible for UI, the longer the duration of the average spell of unemployment.

CHAPTER 6 Unemployment

## Benefits of UI

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- By allowing workers more time to search, UI may lead to better matches between jobs and workers, which would lead to greater productivity and higher incomes.

## Why is there unemployment?

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The natural rate of unemployment:  $\frac{U}{L} = \frac{s}{s+f}$

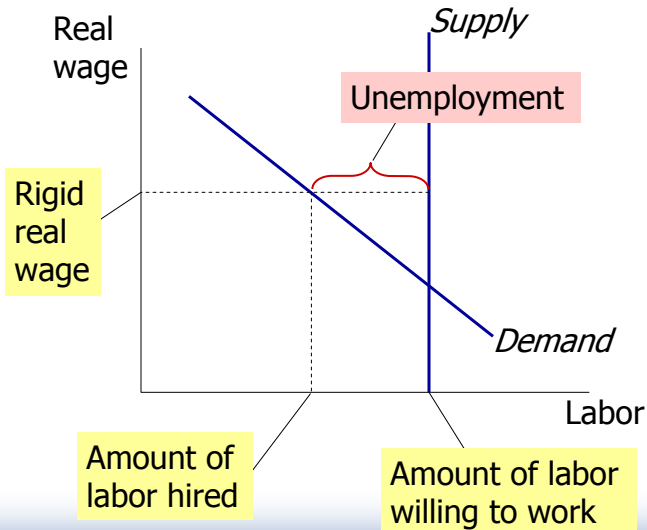
- There are two reasons why  $f < 1$ :

*DONE* ✓ 1. job search

*Next* → 2. wage rigidity

## Unemployment from real wage rigidity

If the real wage is stuck above the eq'm level, then there aren't enough jobs to go around.



## Unemployment from real wage rigidity

If the real wage is stuck above the eq'm level, then there aren't enough jobs to go around.

Then, firms must ration the scarce jobs among workers.

**Structural unemployment:** the unemployment resulting from real wage rigidity and job rationing.