Master in Economics

Labour economics

2026

Lecture

Topics

- **Unemployment**
  - A Stock-Flow Model of the Labour Market
  - Frictional Unemployment
  - Structural Unemployment
  - Demand-Deficient (Cyclical) Unemployment
  - Seasonal Unemployment
  - When Do We Have Full Employment?

Bibliography

- **Ehrenberg, Ronald & Robert Smith, *Modern Labor Economics: Theory and Public Policy*, Chapter 14**
- **Novo, Alvaro & Centeno, Mario, Evaluating job search programs for old and young individuals: Heterogeneous impact on unemployment duration**
- **Novo, Alvaro & Centeno, Mario Do low-wage workers react less to longer unemployment benefits? Quasi-experimental evidence**

Unemployment

- **Concepts**
  - **Population** divided into those in the **labour force (*L*)** and those **not (*N*)**
  - **Labour force:** those who are **employed (*E*) plus** those **unemployed (U)**
  - **Unemployed:**
    - who are not employed, but would like to be employed
    - **economists** define them in terms of an **individual's willingness to be employed at some prevailing market wage**
    - **Statistics:** those on temporary layoff waiting to be recalled by their previous employer or those without a job who have actively searched for work in the reference period ("actively" not precisely defined)
  - **Unemployment rate (*u*) -** the ratio of the number of the unemployed to the number in the labour force ***u = U/L***

Unemployment

- **Limitations of unemployment rate data**

  - do **not necessarily provide an accurate** reflection of the economic **hardship** that members of a group are suffering
  - statistics on unemployment **do not tell us** about**:**
    - individuals who are **not actively searching** for work (including those who searched unsuccessfully and then gave up) and that are not counted among the unemployed
    - the **earnings levels of those who are employed** - a substantial fraction of the unemployed come from families in which other earners are present— e.g., many unemployed are teenagers;
      - the unemployed **often are not the primary source** of income
    - the fraction of the unemployed that **receive some income support** while they are unemployed
    - the **fraction of the population that is employed**

Unemployment

- **Limitations of unemployment rate data**

Table 14.1 Civilian Labor Force Participation, Employment, and Unemployment Rates in the United States (in Percentages)

Year	Unemployment rate (*U/L*)	Labor force participation rate (*L/POP*)	Employment rate (*E/POP*)
1948	3.8	58.8	56.6
1958	6.8	59.5	55.4
1968	3.6	59.6	57.5
1991	6.8	66.2	61.7
2000	4.0	67.1	64.4
2013	7.4	63.2	58.6

Source: U.S. Department of Labor, *2018 Employment and Earnings Online*, Household Survey Data, Table 1, at www.bls.gov/opub/ee/2018/cps/annual.htm#empstat

Unemployment

- **Limitations of unemployment rate data**

Portuguese Labour Market

	LFPR	UR	ER
1992	*48,2*	*4,1*	*56,6*
2000	*51,0*	*3,9*	*58,6*
2011	58,1	12,7	52,8
2016	57,7	11,1	52,0
2017	58,3	8,9	53,7
2018	58,7	7,0	55,0
2019	58,9	6,6	55,0
2020	57,2	7,0	53,1
2021	58,2	6,7	54,3
2022	59,3	6,1	55,6
2023	60,2	6,5	56,3
2024	60,2	6,4	56,4

Source: INE, LFS

Unemployment

- **Unemployment rate** is a useful **indicator of labour market conditions**
- **Need to explain**
  - the **causes** of unemployment
  - how **government policies affect**, in an either intended or unintended manner, **the level of unemployment**

Unemployment: A Stock-Flow Model of the Labour Market

- **Importance of considering**
  - **flows between labour market states**
    - e.g. the movement from employed to unemployed status
  - **the number of people in each labour market state**
    - e.g., the number of the unemployed

Knowing the **determinants of the flows** is crucial to understand the causes of unemployment

Unemployment: A Stock-Flow Model of the Labour Market

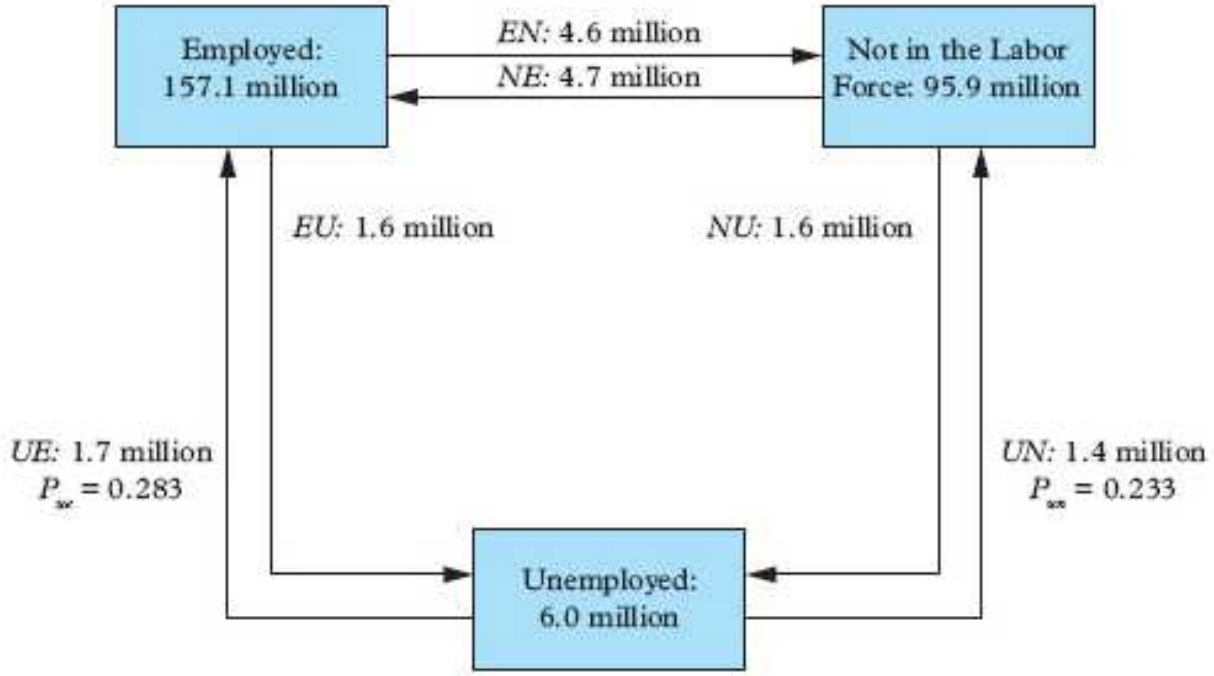


Figure 14.1 Labor Market Stocks and Flows: May to June 2019

Source: U.S. Bureau of Labor Statistics, "Labor Force Statistics from the Current Population Survey: Labor Force Status Flows by Sex," at www.bls.gov/web/empsit/cps_flows_recent.htm

Unemployment: A Stock-Flow Model of the Labour Market

Figure 1. Quarterly labour market flows
(thousand persons)

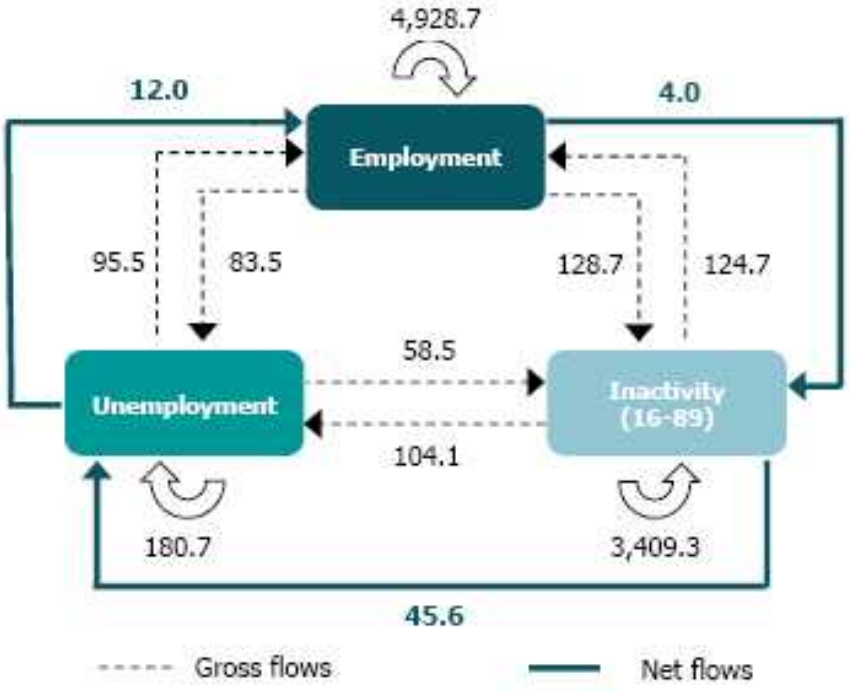
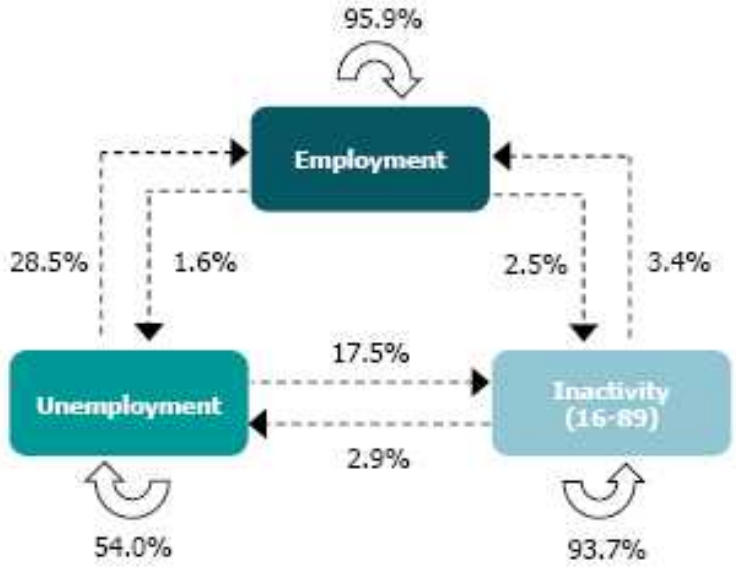


Figure 2. Quarterly labour market flows
(in % of initial status)



Source: Statistics Portugal, Labour Force Survey - 4th quarter of 2024.

Unemployment: A Stock-Flow Model of the Labour Market

- **Duration of Unemployment**
  - **Two ways to leave unemployment:**
    - obtaining a job
    - exiting the labour force
  - **Duration depends on job availability:**
    - in the US, in 2006, unemployed found a job within 5 weeks; in 2010, within 10 weeks
  - **Decision to leave the labour force depends on market conditions**
    - in the US, in 2010, the unemployed that left the labour force did so after 20 weeks of unemployment – discouragement

Unemployment: A Stock-Flow Model of the Labour Market

- **Duration of Unemployment**
  - **the duration and the consequences of unemployment among those who lose their jobs depend on whether the layoff is temporary or permanent**
    - of the 0.6 percent of American workers who were laid off in the average month during the 1990s, a bit less than half were **laid off temporarily** and returned relatively quickly to their jobs (usually within three to six weeks)
    - those who were **permanently discharged**—whether for cause or because of plant closure or "downsizing"— were unemployed for over **twice as long**, and when they returned to work, it was **typically at a much lower pay level**

Unemployment: A Stock-Flow Model of the Labour Market

Paths to Unemployment

US: in the typical year from 1970 to 2019

- roughly half of the unemployed were **job losers**
  - the fraction of job losers was highest in the years of very high unemployment - reached almost two-thirds in 2010
- more than one-third of the unemployed came from **out-of-labour-force status**
  - **new entrants** - individuals who were entering the labour force for the first time
  - **re-entrant** - individuals who had some previous employment experience and were re-entering the labour force after a period of time out of the labour force
- **10 to 15%** of the unemployed were **voluntary job leavers**
  - individuals who quit their jobs to obtain new jobs, but that pass through unemployment status

Unemployment: A Stock-Flow Model of the Labour Market

- **Sources of Unemployment**

Table 14.2 Unemployment, United States, Various YearsPaths to

Year	Unemployment rate	Job losers	Percent of unemployed:		
			Job leavers	Re-entrants	New entrants
1970	4.9	44.3	13.4	30.0	12.3
1974	5.6	43.5	14.9	28.4	13.2
1978	6.1	41.6	14.1	30.0	14.3
1982	9.7	58.7	7.9	22.3	11.1
1986	6.9	48.9	12.3	26.2	12.5
1990	5.5	48.3	14.8	27.4	9.5
1994	6.1	47.7	9.4	34.8	7.6
1998	4.5	45.5	11.8	34.3	8.4
2002	5.8	55.0	10.3	28.3	6.4
2006	4.6	47.4	11.8	32.0	8.8
2010	9.6	62.4	6.0	23.4	8.2
2014	6.2	50.7	8.6	29.4	11.3
2019	3.7	45.6	14.8	30.1	8.9

Sources: U.S. Department of Labor, *Employment and Training Report of the President* (Washington, DC: U.S. Government Printing Office, 1982), Table A-36; U.S. Department of Labor, "Monthly Labor Review, Various Issues," at www.bls.gov/news.release/empsit.t11.htm

Unemployment: A Stock-Flow Model of the Labour Market

- **Rates of Flows Affect Unemployment Levels**

A group's unemployment rate might be high, because:

- its members **have difficulty finding jobs** once unemployed
- they **have difficulty (for voluntary or involuntary reasons) remaining employed** once a job is found
- they **frequently enter and leave** the labour force

Appropriate policy prescription to reduce the unemployment rate will **depend on which one of these labour market flows** is responsible for the high rate.

Unemployment: A Stock-Flow Model of the Labour Market

- **Rates of Flows Affect Unemployment Levels**
  - **the unemployment rate (*u*)** for a group depends on:

$$\mathbf{u} = F(\overset{+}{P}_{en}, \overset{-}{P}_{ne}, \overset{-}{P}_{un}, \overset{+}{P}_{nu}, \overset{+}{P}_{eu}, \overset{-}{P}_{ue})$$

  - **social concern** over any given level of unemployment should focus on:
    - **incidence of unemployment** - the fraction of people in a group who become unemployed
    - **duration of spells of unemployment**

Society probably more concerned if small groups of individuals are **unemployed for long periods** of time **than** if many individuals **rapidly pass through unemployment** status

Unemployment: A Stock-Flow Model of the Labour Market

- **Rates of Flow Affect Unemployment Levels**

Table 14.3 Unemployment and Long-Term Unemployment, Selected European and North American Countries, 2005 and 2019

	Unemployment overall rate (%)		Percent of unemployed out of work > one year	
	2005	2019	2005	2019
Belgium	8.4	5.4	51.6	43.5
Canada	6.8	5.6	9.6	8.5
Denmark	4.8	4.7	25.9	16.6
France	9.5	8.5	42.5	38.8
Germany	9.5	3.1	54.0	38.1
Ireland	4.3	5.1	34.3	33.3
Netherlands	4.8	3.4	40.1	31.4
Norway	4.6	3.6	9.4	24.1
United Kingdom	4.7	3.8	22.4	25.0
United States	5.1	3.7	11.8	12.7

Sources: OECD, *Employment Outlook* (Paris: OECD, 2006), Tables A and G; OECD Data, Unemployment Rate at https://data.oecd.org/unemp/unemployment-rate.htm; and Long-Term Unemployment Rate at https://data.oecd.org/unemp/long-term-unemployment-rate.htm

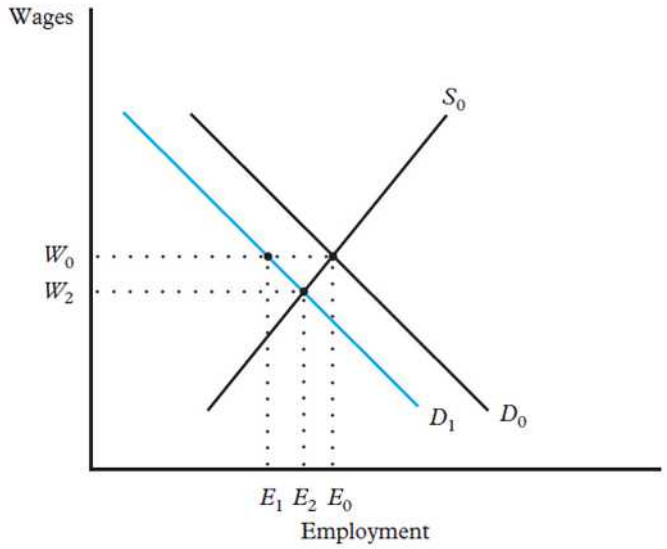
Unemployment: A Stock-Flow Model of the Labour Market

- **Types of unemployment**
  - Frictional
  - Structural
  - Demand-deficient (cyclical)
  - Seasonal

Frictional unemployment

Unemployment: Frictional unemployment

- **Competitive labour market in equilibrium** - at the prevailing market wage, the quantity of labour demanded just equals the quantity of labour supplied
- Equilibrium has been treated as a situation of **full employment;** no unemployment associated with it



But, in a market-equilibrium or full-employment situation, **there will still be some *frictional unemployment*,** because people will move between jobs.

If **wages are downwardly rigid**, shift from D_0 to D_1 will lead to a fall in employment from E_0 to E_1 thus $E_0 - E_1$ additional **workers will be unemployed**.

Unemployment: Frictional unemployment

- **frictional unemployment - some people will be between jobs – there are frictions in the labour market**
  - **information flows are imperfect –** information about the characteristics of those searching for work and the nature of job openings are unknown
  - **it takes time and effort** for unemployed workers and employers with job vacancies to find each other
  - there will be **new entrants** to the labour market searching for employment, **while other** employed or unemployed individuals are **leaving the labour force**
  - some people will **quit their jobs** to search for other employment
  - **random fluctuations in demand across firms** will cause some firms to close or lay off workers **at the same time** that other firms are **opening or expanding employment**

Unemployment: Frictional unemployment

- **The Theory of Job Search**
  - the **level of frictional unemployment** in an economy is determined by the **flows** of individuals **into** and **out** of the labour market **and** the **speed** with which unemployed individuals **find** (and accept) jobs

Unemployment: Frictional unemployment

- **A Model of Job Search**
  - **Workers who want employment must search for job offers:**
    - it will **take time and effort for matches** to be made between unemployed workers and potential employers
      - information about job opportunities and workers' characteristics is imperfect
    - other things equal, the lower the probability that unemployed workers will become employed in a period - **lower P_{ue}** - the **higher** will be their expected **duration of unemployment** and the **higher** will be the **unemployment rate**

Need to understand what can affect P_{ue}

Unemployment: Frictional unemployment

- **A Model of Job Search**

  - **key assumption**: **wages reflect characteristics of jobs**, not with the characteristics of the individuals who fill them
  - **employers differ** in the set of minimum **hiring standards** they use - include educational requirements, job training, work experience, performance on hiring tests, etc.
    - *K* - denotes the minimum skill level a job requires
  - associated with each job there is a **wage, *W(K)***
    - It is an increasing function of the minimum required skill level
    - 2 employers with the same standard will offer the same wage

  Different employers have different hiring standards - there will be a **distribution of wage offers** associated with job vacancies in the labour market - ***f(W)*** – probability distribution of wage offers

Unemployment: Frictional unemployment

- **A Model of Job Search**

  - it is assumed that an **employee knows the shape** of the distribution of wage offers, but **does not know what each particular firm's wage offer or hiring standard** will be
  - **job search process will be random –** visits to firms' employment offices
  - hiring standard or **skill levels *(K)* and wage *(W)* will be highly related** as no firm will hire a worker that does not meet its hiring standards

Unemployment: Frictional unemployment

- **A Model of Job Search**
  - a given unemployed individual with skill level *K**
    - the **maximum wage** this individual could hope to receive **is *W*(K*)***
    - if the individual knew which firms have a hiring standard of *K** he would apply to those firms and would be hired at a wage of *W**

Unemployment: Frictional unemployment

- **A Model of Job Search**
  - suppose alternatively that **job market information is imperfect** - applicant **knows** the shape of the distribution of wage offers, ***f(W)***, he or she **does not know** what each particular firm's **wage offer or hiring standard** will be
    - a person who has a **skill level *K**** **and whose reservation wage is W_R** will accept job offers that pay **between W_R and *W*(K*)***
    - the **higher the probability of finding a job in the range between W_R and *W*(K*)*, the lower the expected duration of unemployment** and
    - the **expected average wage, *E(W)*,** is weighted average of the job offers in the W_R and *W*(K*)* range

Unemployment: Frictional unemployment

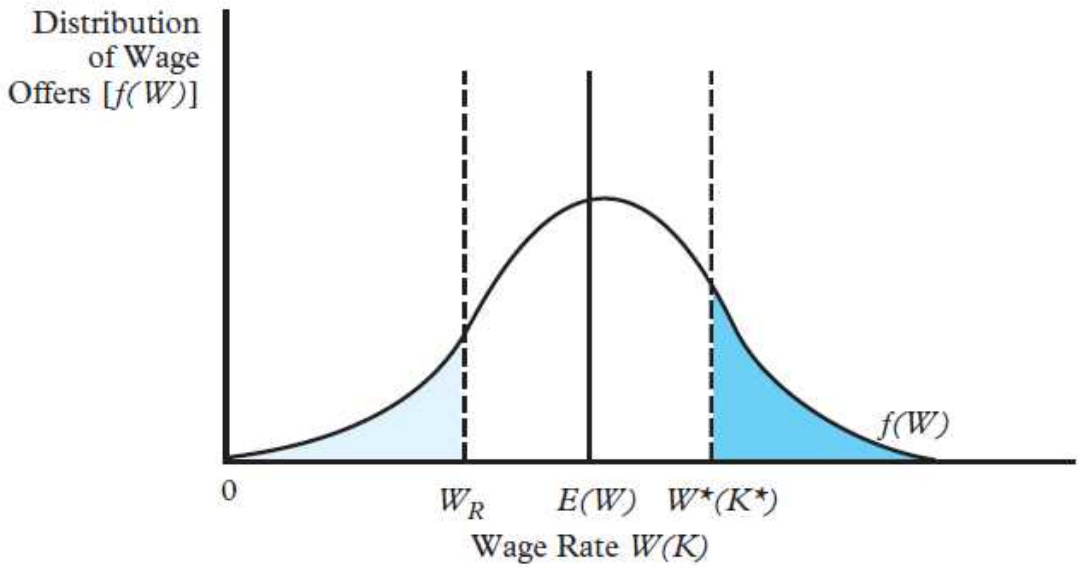
- **A Model of Job Search: The Reservation Wage**

  - if the individual chooses a slightly **higher reservation wage**
    - his or her **expected wage would increase**
    - rejecting more job offers decreases the probability of finding an acceptable job in any given period, thus **increasing the expected duration of unemployment**.

  Each unemployed individual will **choose his or her reservation wage** so that, at the margin, **the expected costs of longer spells of unemployment just equal the expected benefits of higher post-unemployment wages**

Unemployment: Frictional unemployment

- **A Model of Job Search**



If job **market information is imperfect** and a firm's hiring standard **exceeds *K**, a person with skill level *K** is rejected for the job.**

If the hiring standard is ***K** or less, the person with skill level *K** is offered the job.**

Accepting a job offer depends on the number of job offers accumulated, the individual's reservation wage (W_R) as well as the match between *K* and *W* within the W_R and $W^*(K^*)$ range

Unemployment: Frictional unemployment

- **A Model of Job Search: Implications of the Model**
  - **if the reservation wage is not set equal to the lowest wage offered in the market**, the probability of finding a job will be less than 1, and some **unemployment can be expected** to result
    - **search related unemployment** occurs when an individual **does not necessarily accept the first job** that is offered—a **rational** strategy in a world of **imperfect information**

  - **virtually all individuals will be underemployed** - in the sense that their expected earnings will be less than *W**, since the **reservation wage will always be chosen to be less than the wage commensurate with the individual's skill level *W*(K*)***
    - a cost of imperfect information
    - better labour market information would improve the job-matching process

Unemployment: Frictional unemployment

- **A Model of Job Search: Implications of the Model**
  - **otherwise identical individuals will end up receiving different wages** even if they choose the same reservation wage and have the same expected post-unemployment wage
    - in a world of **imperfect information**, **no economic model can explain all the variation in wages across individuals**
  - other things equal, anything that causes **unemployed workers to intensify their job search** (to knock on more doors per day) **will reduce the duration of unemployment**
    - **more efficient** collection/dissemination of **information on both jobs and applicants** can **increase the speed** of the search process for all parties in the market and **reduce unemployment**

Unemployment: Frictional unemployment

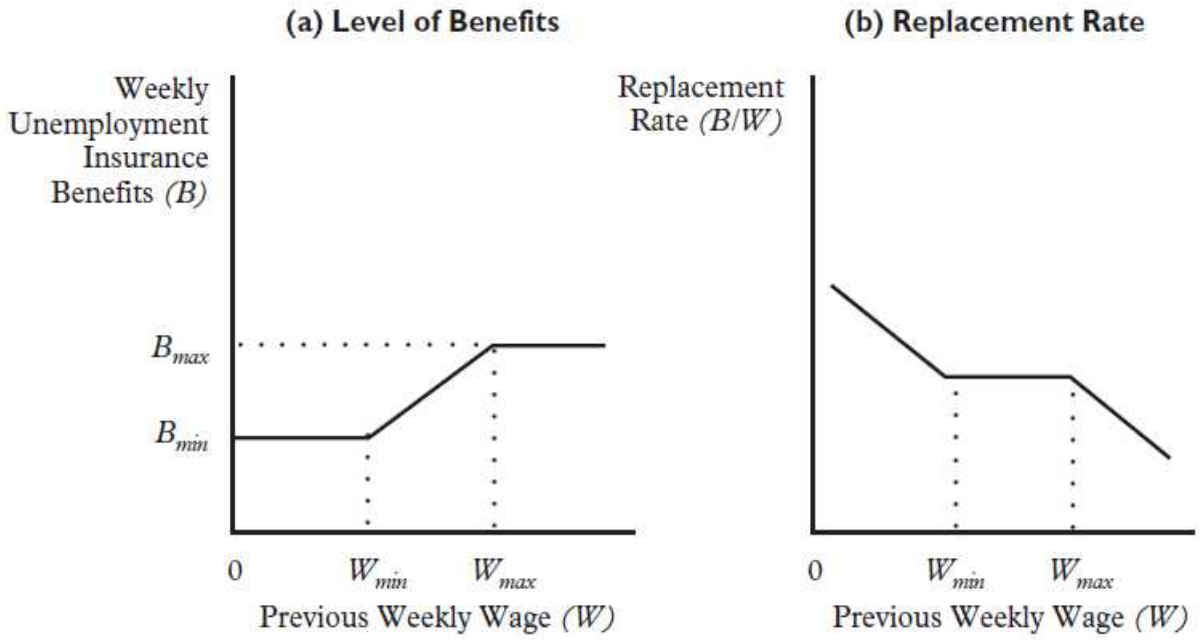
- **A Model of Job Search: Implications of the Model**
  - if the **cost to an individual of being unemployed falls**, the person most likely **increases his or her reservation wage**
    - become "**more choosy**" about the offers deemed to be acceptable
    - **increases both the expected duration** of unemployment and the **expected post-unemployment wage rate**

Unemployment: Frictional unemployment

- **Policy analysis: Effects of Unemployment Insurance Benefits**
  - virtually every advanced economy offers its workers who have lost jobs some form of **unemployment compensation**
  - **eligibility for UI benefits is usually based on previous labour market experience** (e.g. minimum earnings or weeks-worked tests during some base period) **and reason for unemployment** (e.g. being laid off)
  - **benefits** usually are related to an individual's **previous earnings level**

Unemployment: Frictional unemployment

- **Policy analysis: Effects of Unemployment Insurance Benefits**



Level of benefits:
All eligible unemployed workers are entitled to at least a minimum benefit level B_{min} given previous weekly wage W_{min}.

After previous earnings rise above a critical level (W_{min}), benefits increase proportionately with earnings until W_{max}.

Replacement rate:
the ratio of an individual's UI benefits to previous earnings varies according to his/her past earnings. This ratio shows the fraction of previous earnings that the UI benefits replace.

Unemployment: Frictional unemployment

- **Policy analysis: Effects of Unemployment Insurance Benefits**
  - **do generous benefits increase unemployment?**
    - according to the model of job search
      - by **reducing the costs associated with being unemployed**, more generous UI benefits should cause an **increase in the reservation wages** of unemployed workers
      - **increased reservation wages will tend to reduce P_{ue} and P_{un},** which will lengthen the unemployment spell
      - **longer durations will increase the unemployment rate,** other things equal

Evidence from studies suggests that higher UI replacement rates are associated with longer durations of unemployment for recipients

Unemployment: Frictional unemployment

- **Policy analysis: Effects of Unemployment Insurance Benefits**
  - **effects of benefit eligibility**
    - the **mere eligibility** of workers for unemployment compensation benefits has also been found to **influence workers' job-search behaviour**
      - in the United States, for example, there is a **huge jump in the probability of a worker taking a job during the week his or her eligibility for UI benefits ends**

Unemployment: Frictional unemployment

- **Policy analysis: Effects of Unemployment Insurance Benefits**
  - **do more generous benefits improve job matches?**
    - according to the theory of job search, the **increased reservation wage** accompanying more-generous UI benefits will tend to increase the duration of unemployment spells, but it should **also raise the expected post-unemployment wage**

There is only weak evidence that more-generous UI benefits do raise the quality of the subsequent job match

Structural unemployment

Unemployment: Structural Unemployment

- arises when there is:
  - **A mismatch between the skills demanded and supplied in a given area, or**
  - **an imbalance between the supplies of and demands for workers across areas**

- **if wages were completely flexible** and **if costs** of occupational or geographic mobility **were low**, market adjustments would quickly eliminate this type of unemployment
  - in practice these conditions may fail to hold, and structural unemployment may result

Unemployment: Structural Unemployment

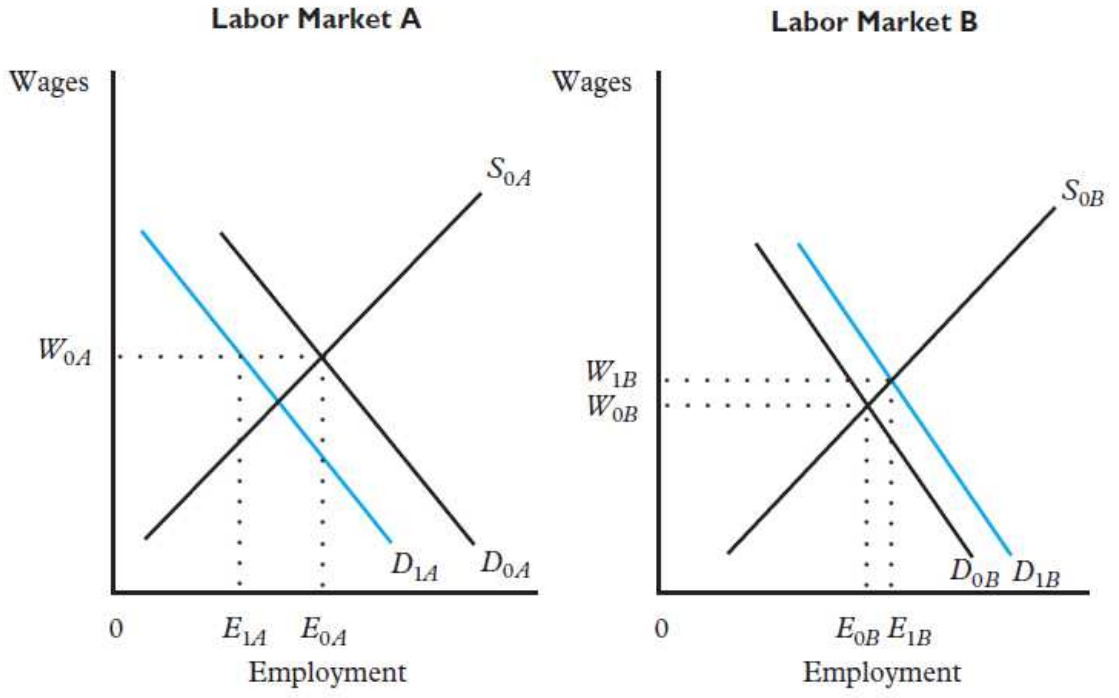
- **Occupational and Regional Unemployment Rate Differences**

  - a **two-sector labour market model –** sectors can be markets for **occupational classes** of workers **or geographically separate** labour markets

  - Example:
    - **market *A:*** production workers in the automobile industry
    - **market *B:*** skilled computer specialists
      - initially both markets are in equilibrium

Unemployment: Structural Unemployment

- **Occupational and Regional Unemployment Rate Differences: occupational imbalances**



Wages need not be equal in the two markets (differences in training costs and nonpecuniary conditions of employment).

If the demand for automobile workers **falls to D_{1A}** and since real wages are **inflexible downward** in market A (union provisions), employment falls to E_{1A}.

If the demand for computer specialists **rises to D_{1B}**, employment and wages of computer specialists will rise to E_{1B} and W_{1B}.

Unemployment of $E_{1A} - E_{0A}$ will be created in labour market A in the short run.

Unemployment: Structural Unemployment

- **Occupational and Regional Unemployment Rate Differences: occupational imbalances**

  - if automobile employees could **costlessly become computer specialists**, these unemployed workers would quickly move to market B, where we assume wages are flexible, and eventually, unemployment would be eliminated
    - Increase in the supply of computer specialists, lowering wages and increasing equilibrium employment.

Unemployment: Structural Unemployment

- **Occupational and Regional Unemployment Rate Differences: regional imbalances**
  - assume that:
    - market *A* is located in a Snowbelt city
    - market *B* is located in a Sunbelt city
    - both markets employ the same type of labour
  - if **demand falls in the Snowbelt** and unemployment increases because wages are not completely flexible, the **unemployed workers will wait for jobs in their home city** for at least three reasons:
    - **information flows are imperfect:** hence workers are unaware of jobs that could be available elsewhere
    - **direct money costs of a move:** including moving costs and the transaction costs involved in buying and selling a home
    - **psychological costs of moving long distances:** are substantial because friends and neighbours and community support systems must be given up

Unemployment: Structural Unemployment

- **Occupational and Regional Unemployment Rate Differences**

  - **structural factors can cause substantial differences** in unemployment rates across states or occupations in a given year, but these differences usually **do not persist indefinitely** due to adjustments caused by movements of workers

  Structural unemployment arises when costs of adjustment are sufficiently high to retard or even prevent movements

- unemployed have a small probability of finding work (P_{ue} is low), implying long unemployment durations

Unemployment: Structural Unemployment

- **International Differences in Long-Term Unemployment**
  - % of the labour force unemployed for **more than one year** is typically much higher in most of Europe than in the US
    - while the US **spends much less on government training programs** than most of Europe – training and retraining programs tend to accelerate movements from *U* to *E*
    - US has a relatively **high rate of geographical mobility**
    - European countries typically have **job-protection policies**
      - notification to the government, consultation with worker representatives, etc. - that are intended to reduce layoffs – these policies discourage the creation of new jobs/hires and thus increase the duration of unemployment
    - the US requires some employers to notify their workers in advance of large-scale layoffs

Unemployment: Structural Unemployment

- **International Differences in Long-Term Unemployment**
  - The flow of workers out of unemployment is accelerated when:
    - **worker retraining** is encouraged
    - workers find it **less costly** to make **geographical moves**
    - employers find it **less costly to create new jobs**

Unemployment: Structural Unemployment

- **Do Efficiency Wages Cause Structural Unemployment?**
  - what are **efficiency wages**?
    - if employers are **unable to completely monitor** the performance of their employees they may decide to **pay above-market (efficiency) wages** to reduce the incentives for workers to shirk their duties
  - efficiency wages are thought to **increase worker productivity**
    - by giving workers the gift of a generous wage, employers might expect that employees would reciprocate by giving them the gift of **diligent work**
    - if an employee's effort is not diligent, the employee can be fired and faced with earning a lower wage or with unemployment

Unemployment: Structural Unemployment

- **Do Efficiency Wages Cause Structural Unemployment?**
  - **efficiency wages affect unemployment**
    - **if all employers pay efficiency wages** then **supply would exceed demand** and unemployment would result
    - **if only some firms paid efficiency wages**, then there would be a high and a low-wage sector
      - workers employed at lower-paying firms could not obtain employment at a high wage firm by offering to work at some wage between the low (market-clearing) and the high (efficiency) wage levels, because the **high-wage employers would want to maintain their wage** advantage to discourage shirking
      - but because jobs in the high-wage sector are preferable **some workers in the low-wage sector may quit their jobs**, attach themselves to the high-wage sector, and **wait for jobs to open up**
        - wait unemployment will tend to arise with an efficiency-wage sector

Unemployment: Structural Unemployment

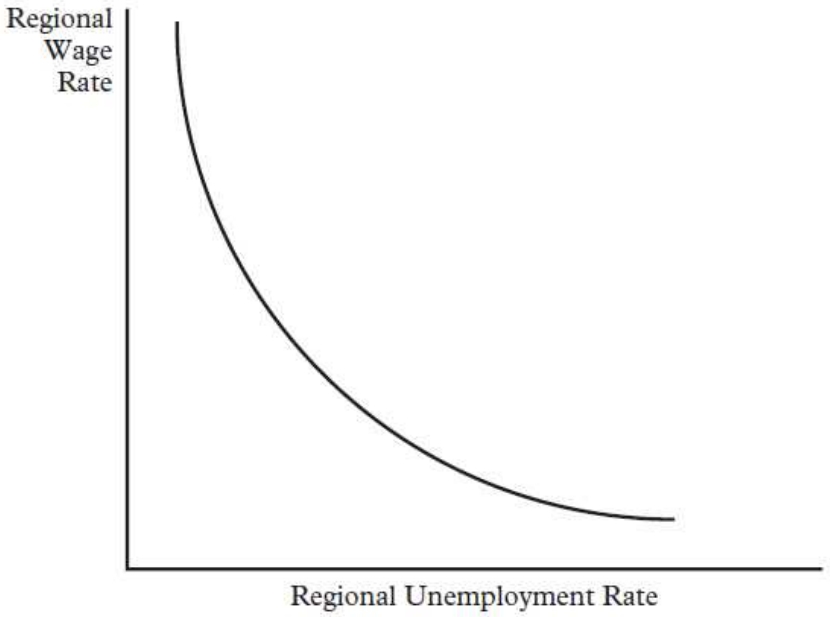
- **Do Efficiency Wages Cause Structural Unemployment?**
  - unemployment affects efficiency wages
    - the wage premium that efficiency wage employers must pay to discourage shirking depends on the alternatives open to their employees
    - other things equal, the **higher the unemployment rate** in an area, the poorer are the alternative employment opportunities for their workers and thus the **less likely to shirking**
    - other factors held constant, there should be a **negative association between average wage rates and unemployment rates across** areas

Unemployment: Structural Unemployment

- **Do Efficiency Wages Cause Structural Unemployment?**
  - efficiency wages and the **wage curve**
    - **wage curve -** the (negative) relationship between the region's unemployment rate and its real wage level
    - an exhaustive study of data on **wages and regional unemployment rates within 12 countries** found that after controlling for human capital characteristics of individual workers (some 3.5 million of them), there was a strong **negative relationship between regional unemployment rates and real wages** in all countries
      - regions within these countries with higher rates of unemployment will experience lower wage levels for otherwise comparable workers

Unemployment: Structural Unemployment

- **Do Efficiency Wages Cause Structural Unemployment?**



A wage curve seems to exist for every country for which enough data are available to estimate it.

The curves for the different countries are surprisingly similar - **a 10% increase in a region's unemployment rate is associated with wage levels that are lower by 0.4 to 1.9%** in 11 of the 12 countries studied.

The wage curve appears to **contradict the conventional demand-and-supply curve analysis**, which suggests a positively sloped wage curve – a positive relationship between higher unemployment and higher wages.

Unemployment: Structural Unemployment

- **Do Efficiency Wages Cause Structural Unemployment?**

  - efficiency wages and the wage curve
    - one reason why we might observe a **negatively sloped wage curve – efficiency wages**:
      - in regions where efficiency wages create higher levels of unemployment, the efficiency wage premiums needed to reduce shirking would be lower—which would cause the negative association we observe between regional unemployment rates and wage levels

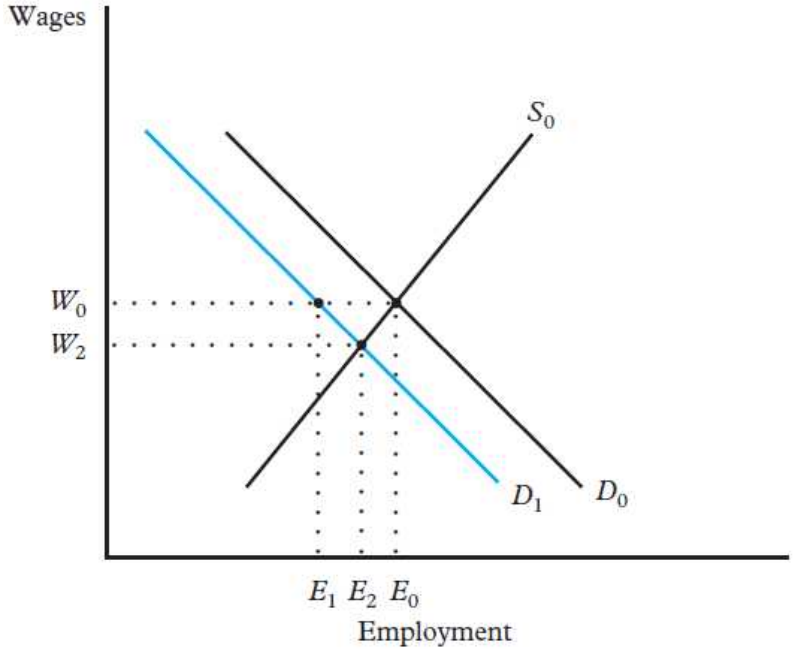
Demand-deficient unemployment

Unemployment: Demand-deficient unemployment

- associated with fluctuations in business activity - the "**business cycle**"
- occurs when a **decline in aggregate demand** in the output market causes the **aggregate demand for labour to decline** in the face of **downward inflexibility in wages**
  - a temporary decline in aggregate demand leads to a shift in the labour demand
  - if **real wages are inflexible downward, employment will fall**
  - employment decline occurs when firms temporarily lay off workers (**increasing P_{eu}**) and reduce the rate at which they replace those who quit or retire (**decreasing P_{ne} and P_{ue}**)
    - flows into unemployment increase while flows into employment decline

Unemployment: Demand-deficient unemployment

- **Unemployment not the inevitable outcome of reduced aggregate demand**
  - **if wages flexible,** if employers reduce the wages they pay to their workers, employment would be lower than its initial level but there would be **no measured demand-deficient unemployment – only some workers would have dropped out of the labour force** in response to the lower wages



Unemployment: Demand-deficient unemployment

- **Downward Wage Rigidity**
  - **the real wages** received by individual workers quite commonly fall
    - real wages can fall due to rising prices or if nominal wages increase less than the increase in prices
  - **nominal wages are not completely rigid** in a downward direction, but they are **resistant to cuts**
    - employment adjustments during periods of downturn are larger and more common than they would be with complete nominal-wage flexibility

Unemployment: Demand-deficient unemployment

- **Why employment levels are more likely to be reduced than nominal wages during business downturns?**
  - why do firms find it **more profitable to reduce employment than wages**?
  - why are workers who face unemployment **not more willing to take wage cuts** to save their jobs?

Unemployment: Demand-deficient unemployment

- **Downward Wage Rigidity**
  - unions
  - specific human capital
  - asymmetric information
  - risk aversion
  - worker status and social norms

Unemployment: Demand-deficient unemployment

- **Wage Rigidity and Unions**

  - **employers not free to unilaterally cut nominal wages because of the presence of unions**
    - a **temporary wage reduction** would reduce the **earnings of all workers**, while **layoffs** would affect, **in most cases, only those workers most recently hired**
      - unions tend to favour a policy of layoffs rather than one that reduces wages for **all members**
      - **the insider-outsider hypothesis** - union members are insiders who have little or no concern for non-members or former members now on layoff (outsiders)

Unemployment: Demand-deficient unemployment

- **Wage Rigidity and Specific Human Capital**
  - **in the presence of firm-specific human capital investments, employers have incentives both to minimize voluntary turnover and to maximize their employees' work effort and productivity**
    - temporary wage reductions would increase all employees' **propensities to quit** and could lead to **reduced work effort** on their part
    - layoffs tend to affect only the **least-experienced workers**—the workers in whom the firm has **invested the smallest amount of resources**
    - it is likely that the firm will find the **layoff strategy a more profitable alternative**

Unemployment: Demand-deficient unemployment

- **Wage Rigidity and Asymmetric Information**

  - employers with **internal labour markets** frequently promise - at least implicitly - **a certain path of earnings to employees over their careers**: firms may pay relatively low salaries to new employees with the promise (expectation) that if they work diligently, they will be paid relatively high wages toward the end of their careers
    - if a firm asks its employees to **take a wage cut** in periods of low demand, employees may believe that the **employer is falsely stating that demand is low**, and their productivity could be reduced by a **loss of trust or a decline in morale**
    - if a firm temporarily lays off some of its workers, it loses the output these workers would have produced, and **workers accept such an action as a signal that the firm is indeed in trouble** - wages exceed current marginal productivity

  Asymmetry of information between employers and employees may make layoffs the preferred policy

Unemployment: Demand-deficient unemployment

- **Wage Rigidity and Risk Aversion**

  - firms with **internal labour markets and long employer–employee job attachments** encouraged by the **risk aversion of older employees to engage in seniority-based layoffs** - last hired, first laid off - rather than wage cuts for all its workers
  - **if the risks of income fluctuation are confined to one's initial years of employment**, the firm **may be able to pay its experienced workers wages lower** than would otherwise be required

Unemployment: Demand-deficient unemployment

- **Worker Status and Social Norms**

  - **why don't workers who are laid off take jobs with smaller employers?**
    (smaller employers pay lower wages and are not constrained, as much as the large firms, from reducing wages further during downturns)
    - **the failure of unemployed workers to flock to low-wage jobs derives from their sense of status** (their relative standing in society) - individuals may prefer unemployment in a good job to employment in an inferior one, at least for a period longer than the typical recession
      - it is the sense of status that prevents the expansion of jobs and the further reduction of wages in the low-wage sectors during recessionary periods
    - **prevailing market wages paid by small, competitive firms, may be accepted as social norms** that inhibit the unemployed from trying to undercut the wages of the employed workers to find employment
      - due to future considerations rather than with status, unemployed workers are apparently more willing to face unemployment than secure or accept employment at a reduced wage

Unemployment: Demand-deficient unemployment

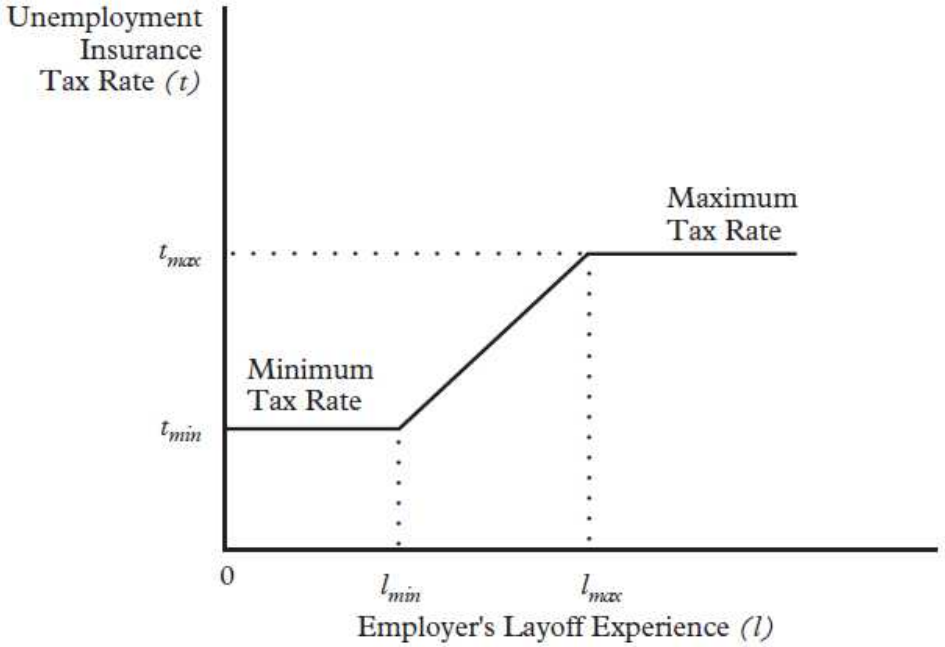
- **Financing U.S. Unemployment Compensation**

  - **incentives for employers to engage in temporary layoffs in the US affected by the method the UI system finance benefits** - the way in which the government raises the funds to pay for UI benefits has a large effect on cyclical layoffs
  - **the UI Payroll Tax**
    - $T = t\ W$ if $W =< W_B$
    - $T = t\ W_B$ if $W > W_B$

    t is the employer's UI tax rate
  - **the employer's UI tax rate (t) determined by**
    - general economic conditions in the state
    - the industry the employer is operating in
    - **the employer's layoff experience** - employers who lay off workers frequently and make heavy demands on the system's resources should be assigned a higher UI tax rate - **experience rating**

Unemployment: Demand-deficient unemployment

- **Financing U.S. Unemployment Compensation**
  - **imperfect experience rating**
    - experience rating is typically imperfect - the **marginal cost** to an employer of **laying off** an additional worker (in terms of a higher UI tax rate) **is often less than the added UI benefits** the system must pay out to that worker



UI tax rate cannot fall below t_{min} – employers whose layoffs fall below l_{min} will pay UI tax rate t_{min}.

As employers experience increased layoffs between l_{min} and l_{max}, the UI tax rate will be in the range t_{min} and t_{max}.

UI tax rate will not rise above t_{max} for additional layoffs above l_{max}.

Unemployment: Demand-deficient unemployment

- **Financing U.S. Unemployment Compensation**

  - **imperfect experience rating**
    - the system is imperfectly experience-rated because for firms **below I_{min} or above I_{max},** variations in their layoff rate have **no effect on their UI tax rate**
    - over the range in which the tax rate is increasing with layoff experience, **the increase is not large enough in most states** to make the **employer's marginal cost of a layoff** (in terms of the increased UI taxes the firm must pay) equal to the **marginal UI benefits the laid-off employees receive**

Unemployment: Demand-deficient unemployment

- **Financing U.S. Unemployment Compensation**

  - **does the UI tax encourage layoffs?**
    - the imperfect experience rating of the UI payroll tax influences the desirability of temporary layoffs
      - **if UI tax rate employers must pay is totally independent of their layoff experience (no experience rating) a firm saves a laid-off worker's entire wages because its UI taxes do not rise as a result of the layoff.**
      - compared with a UI system with perfect experience rating a system with incomplete experience rating will tend to enhance the attractiveness of layoffs to employers

  Studies have estimated that **unemployment would fall by 10% to 33%**, if UI taxes in the United States were **perfectly experience-rated** (so that employers laying off workers would have to **pay the full cost of the added UI benefits**)

Seasonal unemployment

Unemployment: Seasonal Unemployment

- **similar to demand-deficient unemployment** in that it is induced by fluctuations in the demand for labour
- **the fluctuations can be regularly anticipated** and follow a **systematic pattern** over the course of the year

- **Question:** why do employers respond to seasonal patterns of demand by laying off workers rather than reducing wage rates or hours of work?
- **Answer:** for all the reasons cited for the existence of cyclical unemployment and temporary layoffs for cyclical reasons

  - one study has shown that the expansion of the UI system that led to the **coverage of most agricultural employees was associated with a substantial increase in seasonal unemployment in agriculture**
  - studies of seasonal layoffs in nonagricultural industries also suggest that **imperfect experience rating of the UI tax significantly increases seasonal unemployment**

Unemployment: Seasonal Unemployment

- **Question:** why workers would accept jobs in industries in which they knew they would be unemployed for a portion of the year?

- **Answer:** for **some workers**, the existence of UI benefits along with the knowledge that they will be rehired at the end of the slack-demand season may allow them to **treat such periods as paid vacations**

  But **most workers will not find such a situation desirable** since UI benefits typically replace less than half of an unemployed worker's previous gross earnings - and even smaller fractions for high-wage workers

  - to attract workers to seasonal industries, firms will have to **pay workers higher wages to compensate** them for being periodically unemployed
  - One recent study found that **agricultural workers in seasonal jobs earned about 10% more per hour** than they would have earned in permanent farm jobs

Unemployment: Seasonal Unemployment

- **The existence of wage differentials** that compensate workers in high unemployment industries for the **risk of unemployment** makes it difficult to evaluate whether this **unemployment is voluntary or involuntary**
  - on the one hand, workers have **voluntarily agreed to be employed in industries that offer higher wages and higher probabilities of unemployment**
  - on the other hand, **once on the job, employees usually prefer to remain employed** rather than becoming unemployed
- Such unemployment may be considered either voluntary or involuntary, then, depending on one's perspective

When do we have Full Employment?

Unemployment: When do we have Full Employment?

- **Governments constantly worry about:**
  - **an unemployment rate that is too high**
    - implies that many people are **unable to support themselves** and that many of the country's workers are **not contributing to national output**
    - often, governments will take steps to **stimulate the demand** for labour in one way or another when they believe unemployment to be excessive
  - **an unemployment rate that is too low**
    - reflect a situation in which there is **excess demand** in the labour market
    - if labour demand exceeds supply, wages will tend to rise and wage increases will **lead to price inflation**
    - may **increase shirking** among workers and **reduce the pool of available talent** on which new or expanding employers can draw

Unemployment: When Do We Have Full Employment?

- **The Natural Rate of Unemployment: what unemployment rate represents full employment?**

  difficult to define precisely; alternative concepts:

  1) rate **at which wage and price inflation are either stable** or at acceptable levels – NAIRU or NAWRU
  2) rate of unemployment at which **job vacancies equal the number of unemployed workers**
  3) rate at which any **increases in aggregate demand will cause no further reductions in unemployment** or unemployment is voluntary
  4) rate at which the **level of unemployment is unchanging and both the flows into unemployment and the duration of unemployment are normal**

Unemployment: When Do We Have Full Employment?

- **Natural Rate of Unemployment**
  - **affected by** such factors as **voluntary turnover rates** among employed workers, **movements in and out of the labour force**, and the **length of time** it takes for the unemployed **to find acceptable jobs**
  - **factors vary widely across demographic groups** - the **natural rate** during any period is strongly **influenced by the demographic composition** of the labour force
    - growth in the labour force participation rates of females and substantial changes in the relative size of the teenage, black, and Hispanic populations
      - between 1975 and 2017, the proportion of the labour force that was female grew from 40 percent to 47 percent. The Hispanic labour force grew faster than the average – from 4 percent to 17 percent. The teenage share of the labour force dropped from over 9 percent in 1975 to less than 4 percent by 2017
  - **the overall unemployment rate reflects both the tightness of the labour market and the composition of the labour force**

Unemployment: When Do We Have Full Employment?

- **Unemployment and Demographic Characteristics**

Table 14.4 Unemployment Rates in 2017 by Demographic Group

Age	White men	White women	Black men	Black women	Hispanic men	Hispanic women	All
16–17	14.9	13.1	28.5	21.7	17.3	20.5	
18–19	12.3	9.8	30.7	17.4	15.3	10.8	
20–24	7.4	5.4	13.2	9.8	7.5	7.7	
25–54	3.2	3.4	6.7	6.5	3.8	5.0	
55–64	2.8	2.9	5.6	4.3	3.4	4.4	
Total	3.8	3.8	8.1	6.9	4.7	5.7	4.4

Source: U.S. Department of Labor, *2018 Employment and Earnings Online: Household Survey Data*, Tables 3 and 4, at www.bls.gov/opub/ee/2018/cps/annual.htm

Unemployment: When Do We Have Full Employment?

- **Unemployment and Demographic Characteristics**
  - **high unemployment rates for teens and young adults** of each race/gender group relative to older adults in these groups
  - **black unemployment rates at least double white** unemployment rates for most age/gender groups
  - **Hispanic-American unemployment rates** tending to lie in between black and whites
  - **female unemployment rates roughly equal to, or lower than, male unemployment rates** for each group except Hispanics and those of prime age

Unemployment: When Do We Have Full Employment?

- **What Is the Natural Rate?**

  - economists' estimates of the natural rate varied over time - **5.4 percent in the 1960s, to about 7 percent in the 1970s, to 6 or 6.5 percent in the 1980s**
  - recent work suggests the natural rate has been between **4 and 5** in the past decade
  - when unemployment rises above its full-employment or natural level, resources are being wasted
    - Arthur Okun pointed out that every **one-percentage-point decline in the aggregate unemployment rate was associated with a three-percentage-point increase in the output** the United States produces – *the **Okun law***
    - more recent estimates suggest that the relationship is now more in the range of a **two-percentage-point increase in output**
  - **Milton Friedman** - leader in the development of the *NRU* concept - **cautioned against any attempts to forecast it**