

Topics for Today

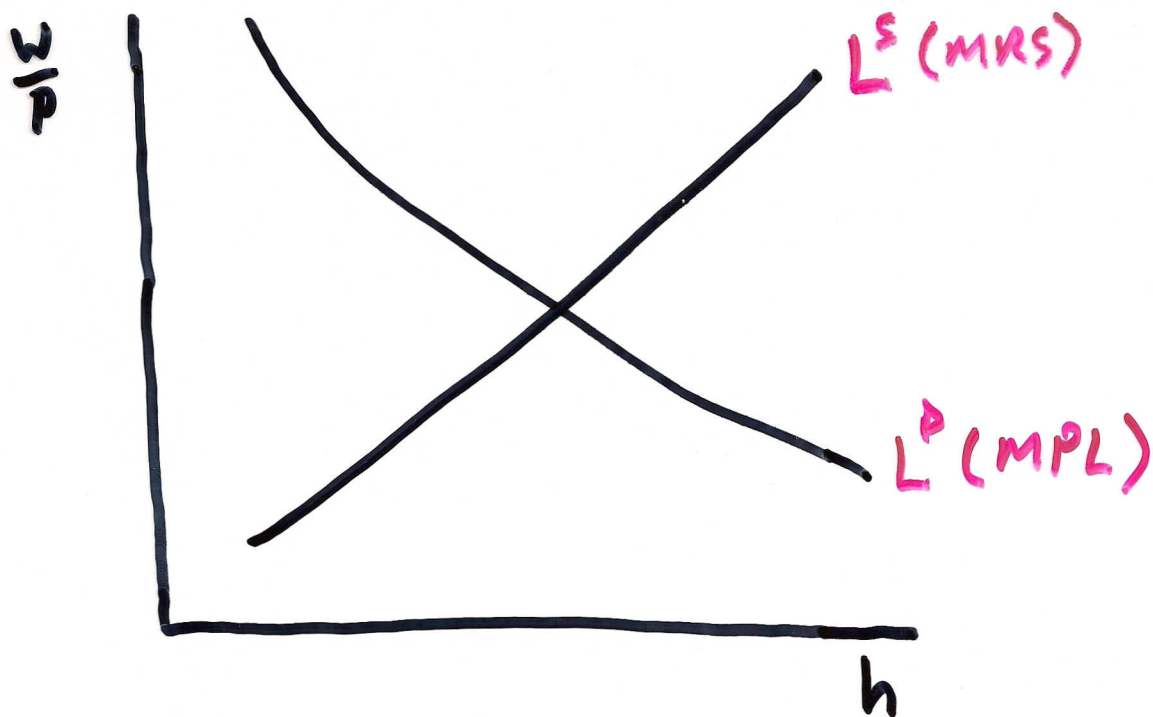
1.) Taxes and Labor Supply

- "Why Do Americans Work So Much More Than Europeans?"
(Prescott, 2004)

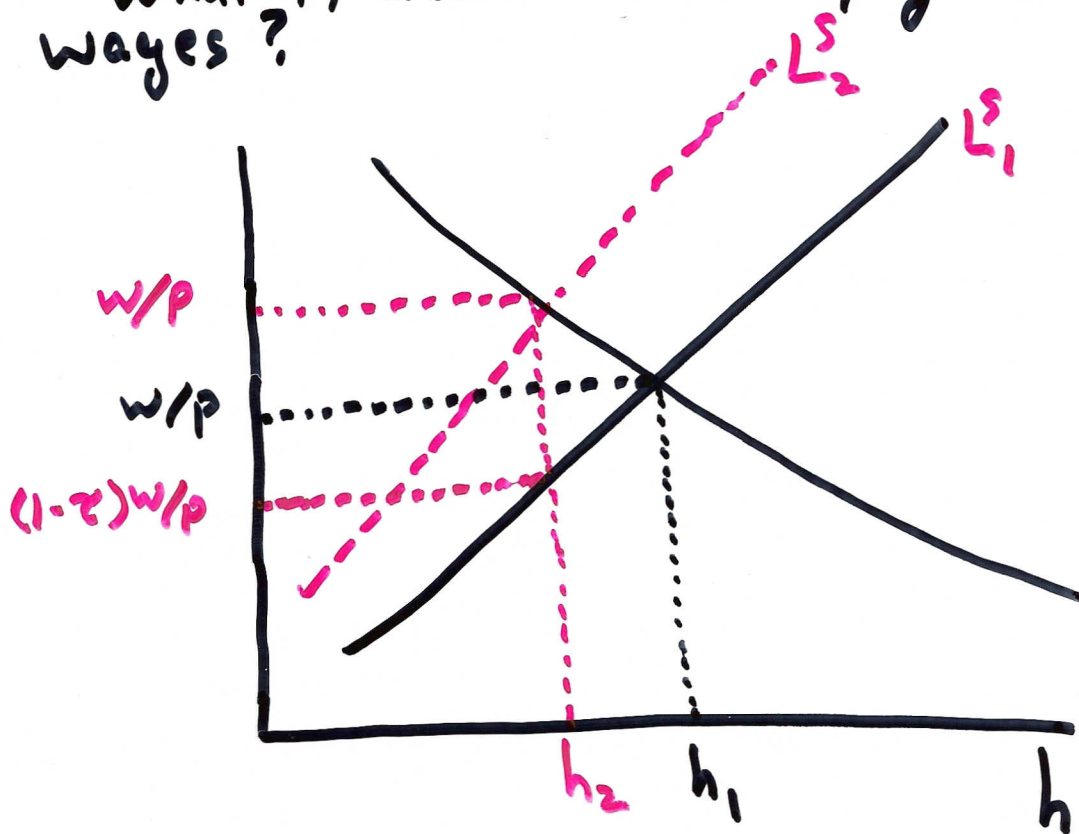
2.) Unemployment

- Defining and Measuring Unemployment
- Theories of Unemployment
 - Search Frictions (the "natural rate of unemployment")
 - Wage Rigidity

Labor Market Equilibrium



What if workers have to pay taxes on their wages?



"Why Do Americans Work So Much More Than Europeans?"

Prescott (2004)

Consider the following 3 facts:

- 1.) In the 1970s, Americans & Europeans worked about the same amount.
- 2.) By the late 1990s, Americans were working about 40-50% more than Europeans.
- 3.) Taxes in Europe during this period rose considerably relative to those in the U.S.

Can increased European taxes explain the relative decline in European labor supply quantitatively?

Prescott assumes preferences are the same across countries, and they are stable over time.

They are given by:

$$\log c_t + \alpha \log(100 - h_t)$$

where h_t = weekly hours of labor

$$\alpha = 1.54$$

Production is described by Cobb-Douglas

$$y_t = A_t K_t^\theta h_t^{1-\theta} \quad \theta = .32$$

2 key FOCs

$$1.) \frac{\alpha/(1-h)}{1/c} = (1-\tau)w$$

$$2.) (1-\theta)AK^\theta h^{-\theta} = (1-\theta)y/h = w$$

Combining (1) and (2)

$$h = \frac{1-\theta}{1-\theta + c/y \frac{\alpha}{1-\tau}}$$

Table 1

Output, Labor Supply, and Productivity

In Selected Countries in 1993-96 and 1970-74

Period	Country	Relative to United States (U.S. = 100)		
		Output per Person*	Hours Worked per Person*	Output per Hour Worked
1993-96	Germany	74	75	99
	France	74	68	110
	Italy	57	64	90
	Canada	79	88	89
	United Kingdom	67	88	76
	Japan	78	104	74
	United States	100	100	100
1970-74	Germany	75	105	72
	France	77	105	74
	Italy	53	82	65
	Canada	86	94	91
	United Kingdom	68	110	62
	Japan	62	127	49
	United States	100	100	100

*These data are for persons aged 15-64.
Sources: See Appendix.

Table 2

Actual and Predicted Labor Supply

In Selected Countries in 1993-96 and 1970-74

Period	Country	Labor Supply*		Differences (Predicted Less Actual)	Prediction Factors	
		Actual	Predicted		Tax Rate τ	Consumption/ Output (c/y)
1993-96	Germany	19.3	19.5	.2	.59	.74
	France	17.5	19.5	2.0	.59	.74
	Italy	16.5	18.8	2.3	.64	.69
	Canada	22.9	21.3	-1.6	.52	.77
	United Kingdom	22.8	22.8	0	.44	.83
	Japan	27.0	29.0	2.0	.37	.68
	United States	25.9	24.6	-1.3	.40	.81
1970-74	Germany	24.6	24.6	0	.52	.66
	France	24.4	25.4	1.0	.49	.66
	Italy	19.2	28.3	9.1	.41	.66
	Canada	22.2	25.6	3.4	.44	.72
	United Kingdom	25.9	24.0	-1.9	.45	.77
	Japan	29.8	35.8	6.0	.25	.60
	United States	23.5	26.4	2.9	.40	.74

*Labor supply is measured in hours worked per person aged 15-64 per week.
Sources: See Appendix.

Caveats

- 1.) Prescott assumes that tax revenues are rebated lump-sum back to households. This kills off the negative income effect of higher taxes, which would tend to increase labor supply in response to higher taxes.
- 2.) Prescott picks a pretty high value of the labor supply elasticity parameter ($\alpha = 1.54$)
- 3.) Prescott ignores unemployment. Over this period, European unemployment rates rose considerably relative to the U.S.

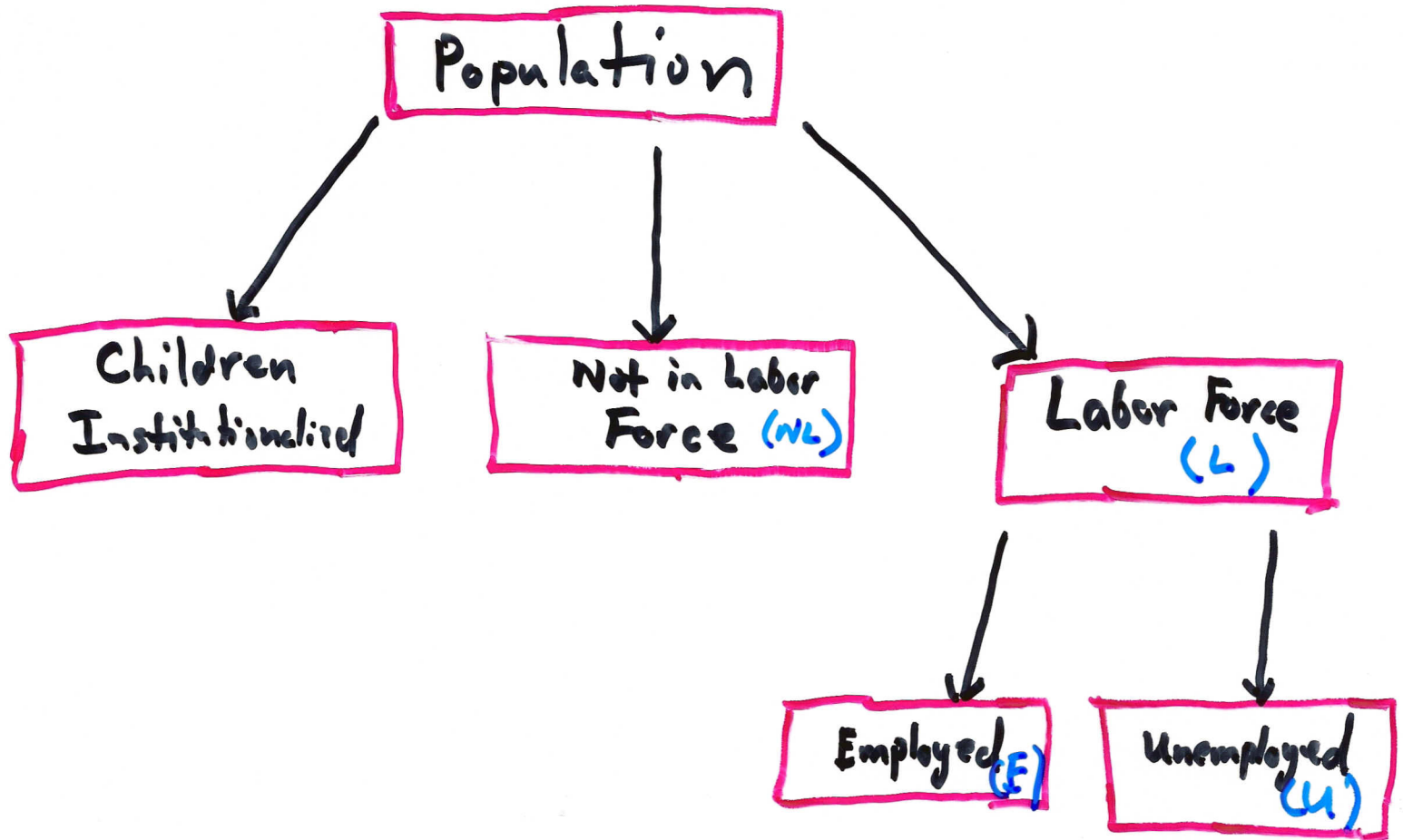
Unemployment

- So far we have assumed that anyone who wants to work can work. This is not always the case.
- In the real world, most fluctuations in labor input take the form of some people losing or gaining jobs, rather than everyone choosing to work a few less or a few more hours. That is, labor supply is very uneven. There is a lot of heterogeneity.
- Explaining why this occurs is one of the primary questions in macroeconomics
- For many years, macroeconomists argued amongst themselves about whether unemployment is "voluntary" or "involuntary". This proved not to be a useful distinction. Surely, it's both! An unemployed carpenter could probably get a job pretty quickly at McDonalds. In that sense, his unemployment is voluntary. On the other hand, skilled workers often lose their jobs involuntarily, and even if they could find unskilled jobs quickly, there is a sense in which their search for a similarly skilled job is involuntary.

Costs of Unemployment

- 1.) Foregone Output. Wasted Resources
- 2.) Social Costs. Crime, divorce,
alcoholism, suicide.
- 3.) Inequality

Measuring Unemployment



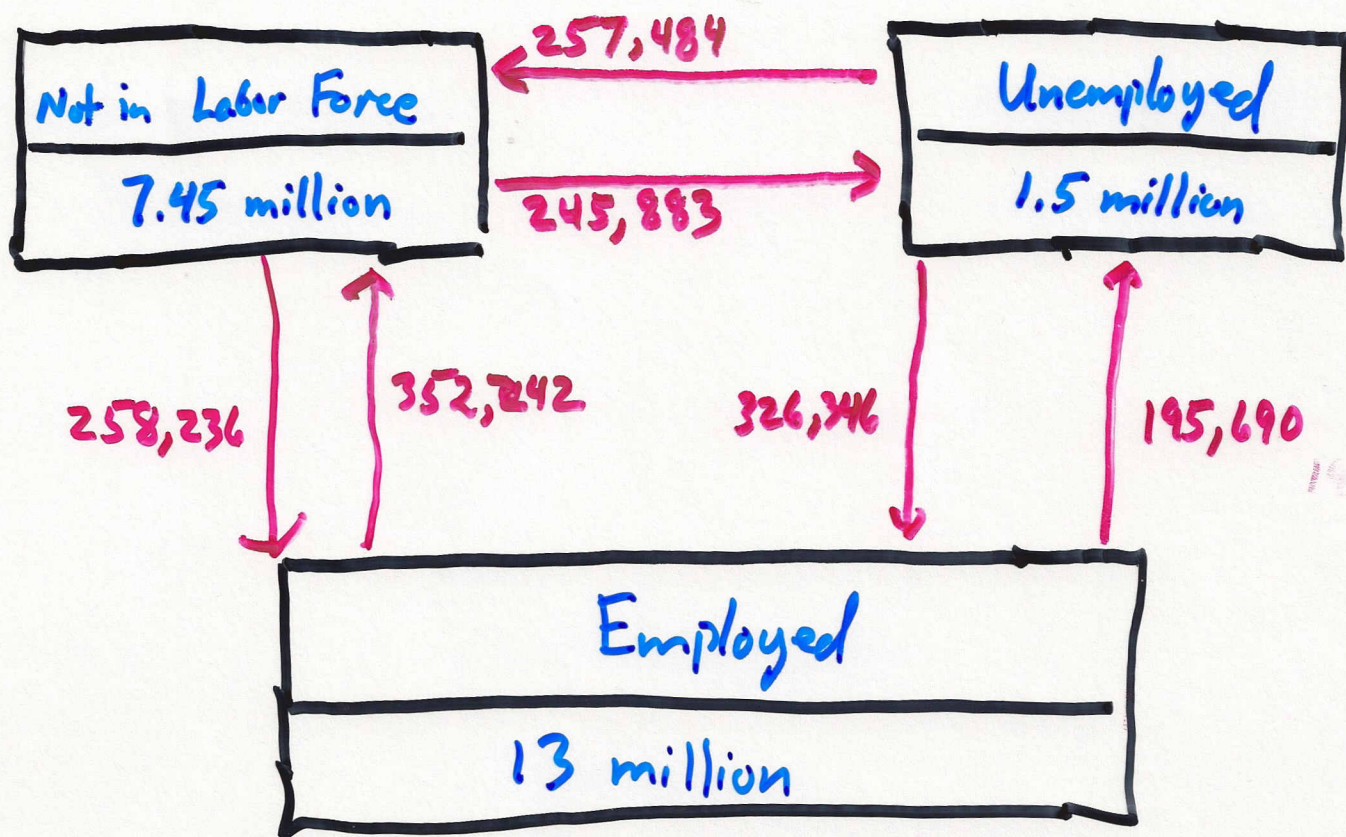
1.) Participation Rate = $\frac{L}{L + NL}$

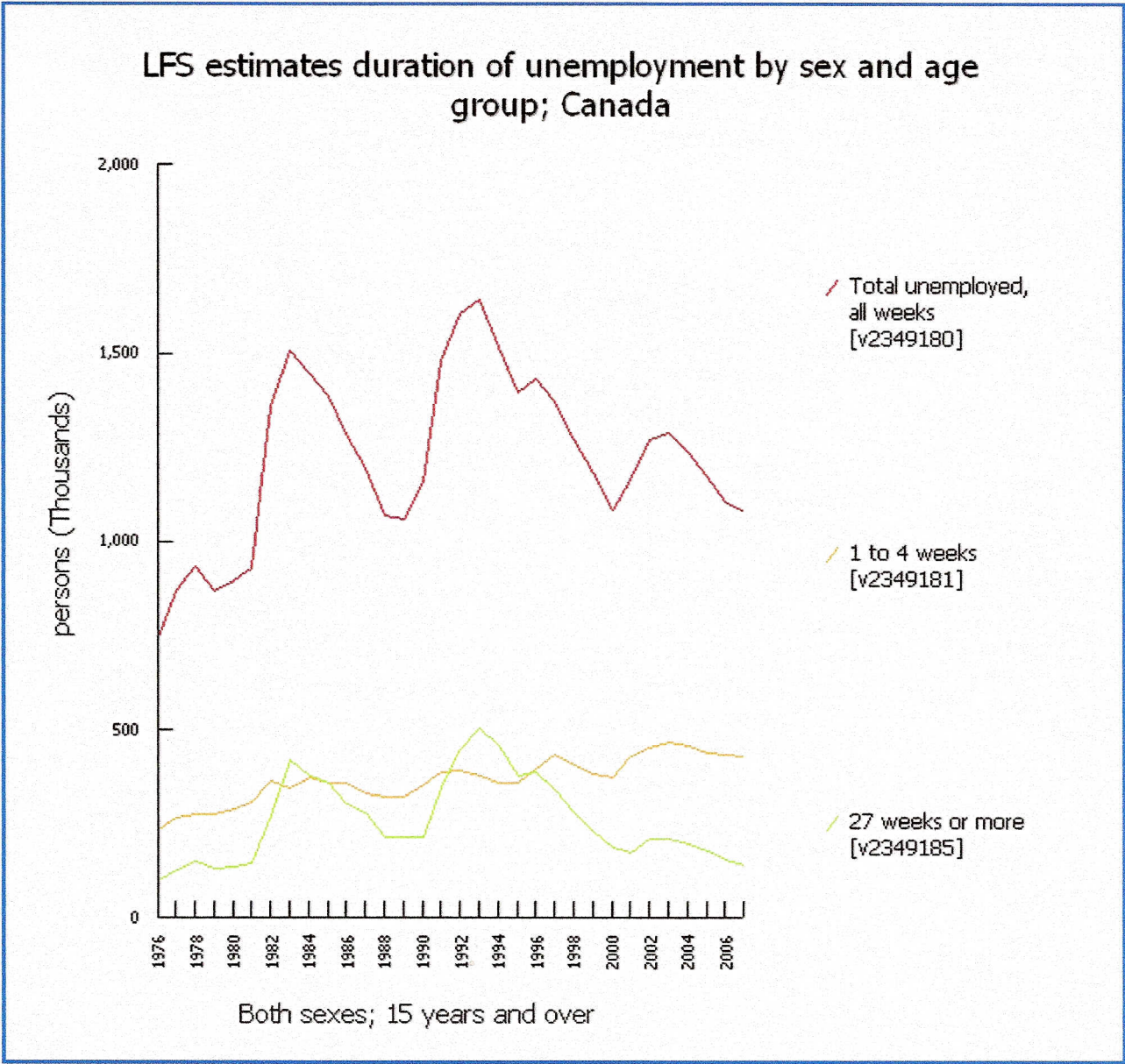
2.) Unemployment Rate = $\frac{u}{L} = \frac{u}{E + u}$

Note,

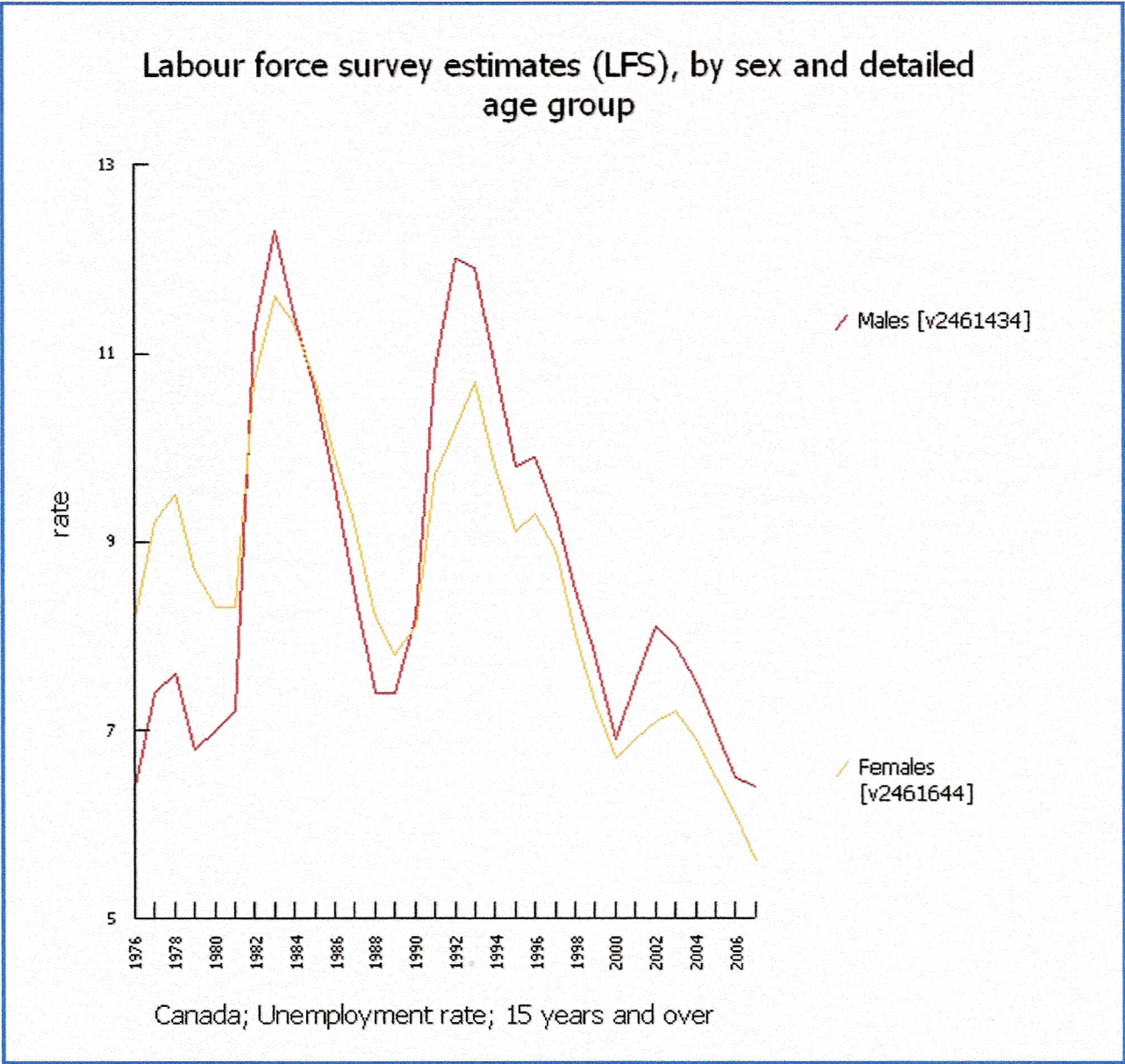
- 1.) To be considered unemployed, you must be in the labor force, meaning that you are "actively" looking for a job.
- 2.) The unemployment rate can (and does) change even when there is no change in the number of unemployed people. This occurs when the participation rate changes.
- 3.) There are large gross flows between these categories.

Average Monthly Flows

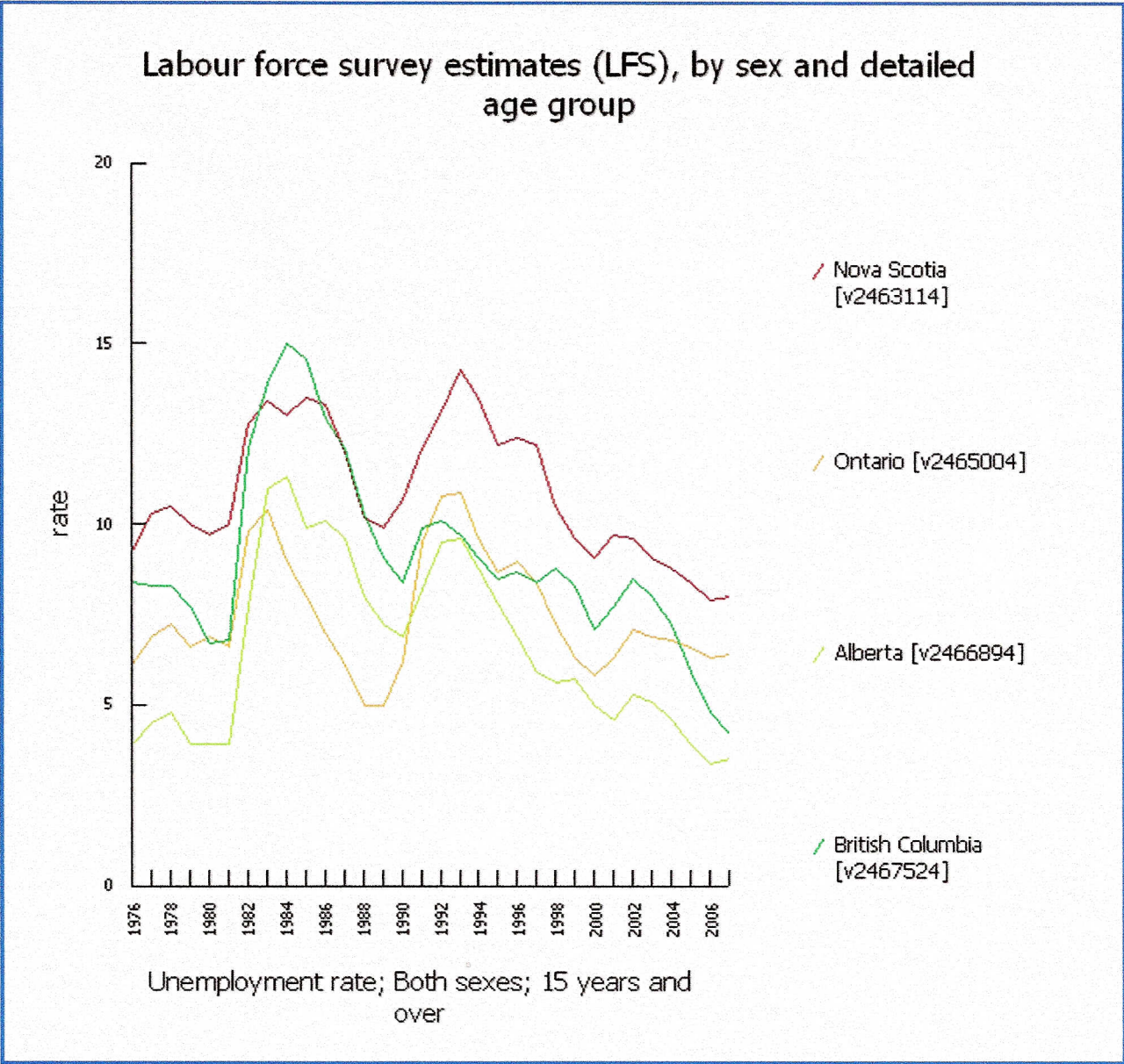




Source: Statistics Canada, CANSIM table 282-0048.



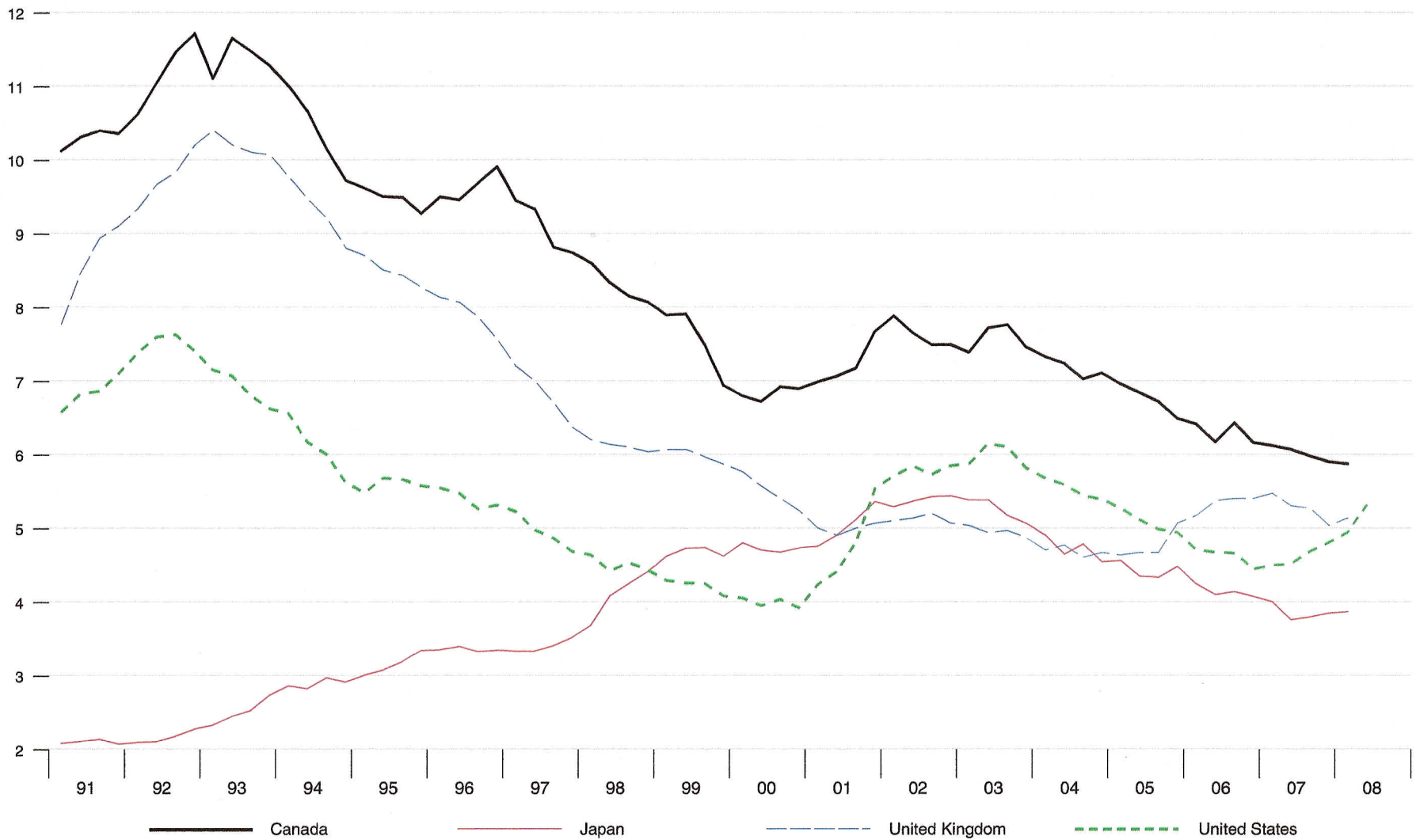
Source: Statistics Canada, CANSIM table 282-0002.



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Unemployment Rate for Canada, Japan, United Kingdom, and United States

Percent

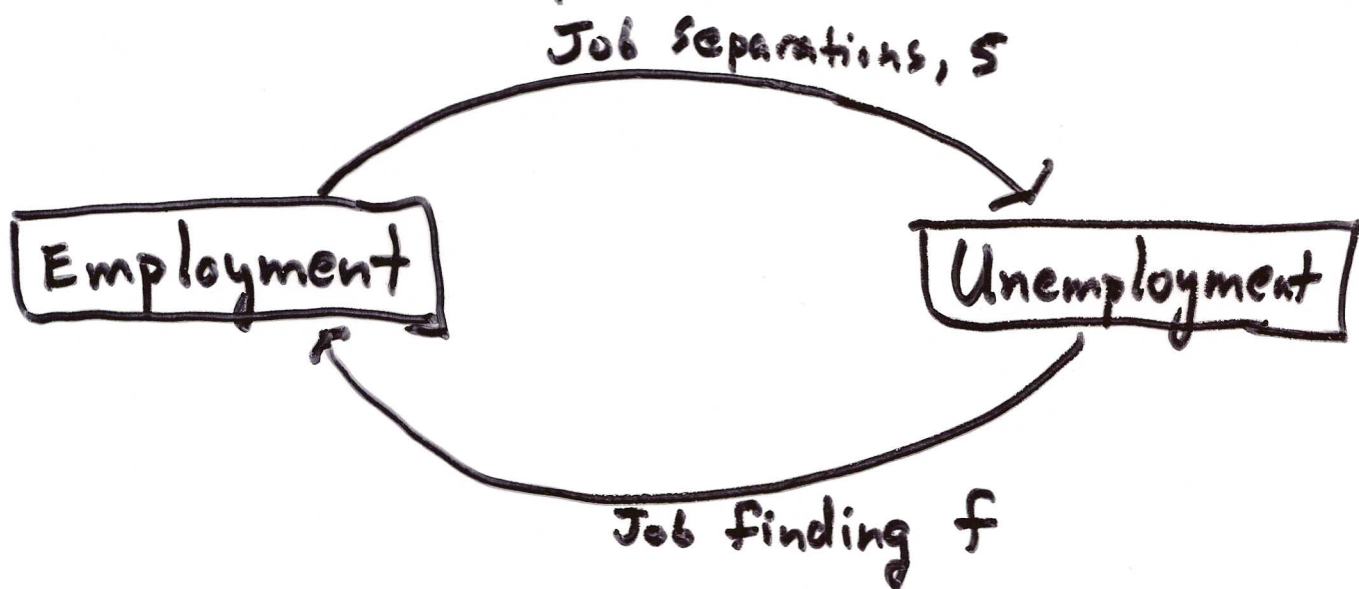


Sources of Persistent Unemployment

- 1.) Search Frictions / Job Matching
- 2.) Wage Rigidity

Search Frictions / Job Matching

The "bath-tup model"



s : separation rate

= Fraction of those employed who lose or quit their job each period

f : Finding rate

= Fraction of those unemployed who find a job each period

Note, if f and s are constant then $\frac{1}{s}$ = Expected duration of a job

$\frac{1}{f}$ = Expected duration of an unemployment spell

Steady-State Balance Condition: $fU = sE$

Note: $L = E + U$

$$\Rightarrow fU = s(L - U)$$

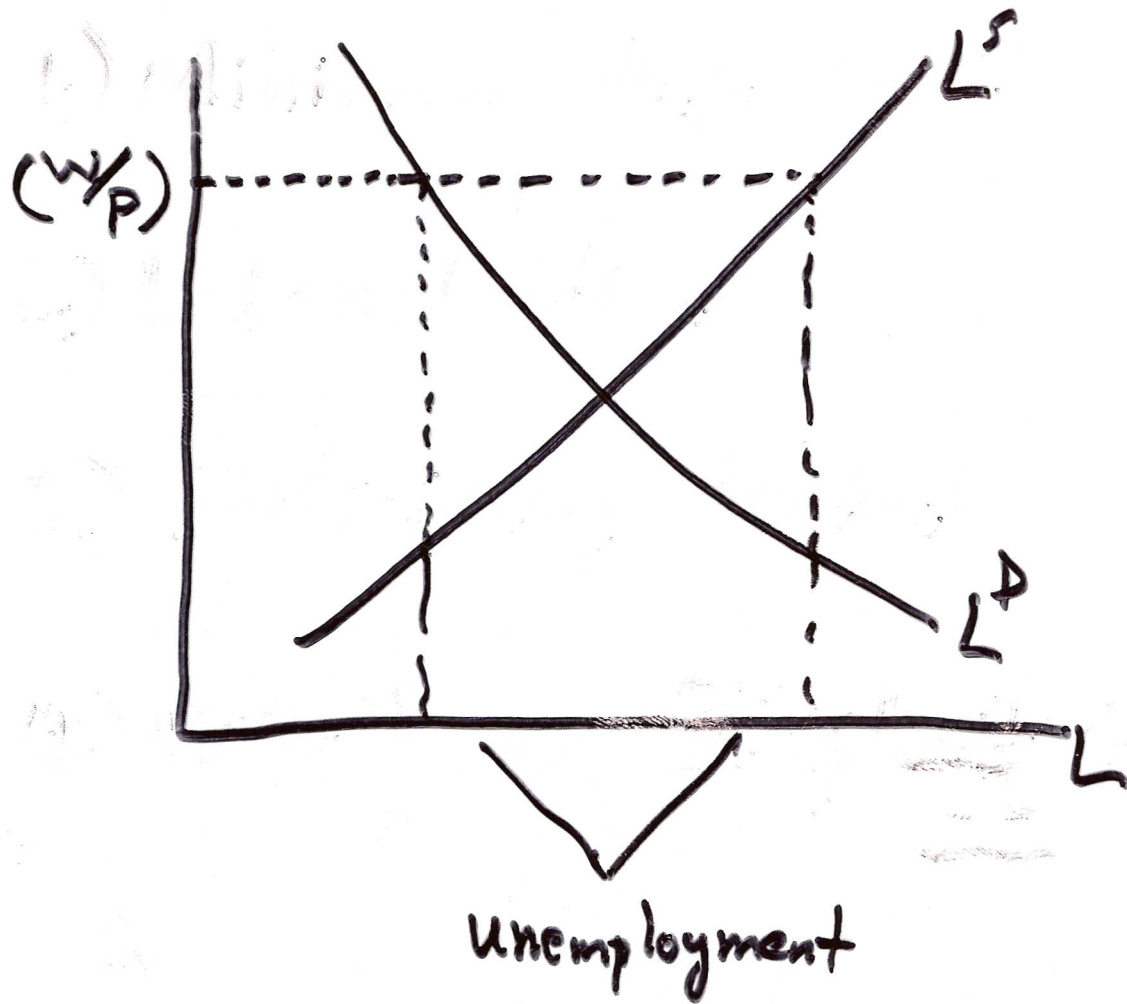
$$\Rightarrow \frac{U}{L} = \frac{s}{s+f}$$

Ballpark Numbers,

$$s = .01 \quad f = .125$$

$$\Rightarrow \frac{U}{L} = \frac{.01}{.135} = 7.4\%$$

Wage Rigidity



Sources of (Persistent) Wage Rigidity

- 1.) Minimum Wage Laws
- 2.) Labor Unions
- 3.) Efficiency Wages
- 4.) Risk-Sharing / Implicit Contracts

Efficiency Wages

Usual interpretation of wage/productivity correlation:

higher productivity $\Rightarrow$ higher wages

In some cases, it could be:

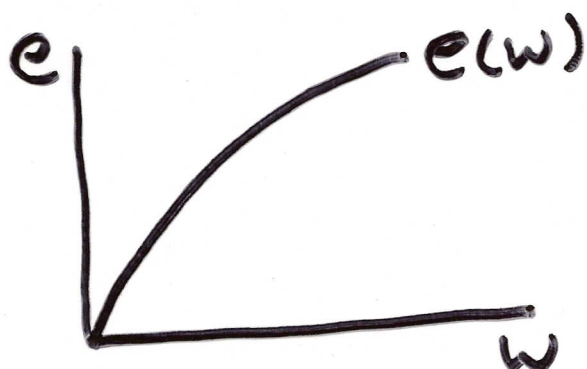
higher wages $\Rightarrow$ higher productivity

Why?

- 1.) Health & Nutrition
- 2.) Improved Morale
- 3.) Shirking
- 4.) Selection Effects

The Morale/Health Model

Let $e(w)$ be the "effort function"



Note: $e(w) \cdot L$ = Labor input measured in efficiency units

Revised Profit-Max Problem

$$\max_{w, L} F(e(w)L) - w \cdot L$$

FOCs 1.) $F' e - w = 0 \quad (L)$

2.) $F' e' L - L = 0 \quad (w)$

$$\Rightarrow \frac{e'}{e} w = 1 \quad \text{or} \quad \frac{de}{e} = \frac{dw}{w} \Rightarrow w^*$$

L^* then determined by $F'(e(w^*)L) = w^*$

The Shirking Model

Let s = exogenous separation rate
 q = probability of getting caught shirking
 E = effort cost
 W = wage rate

Note, $\frac{1}{s}$ = expected job duration if you don't shirk
 $\frac{1}{s+q}$ = expected job duration if you shirk

Firms want to keep their workers from shirking!

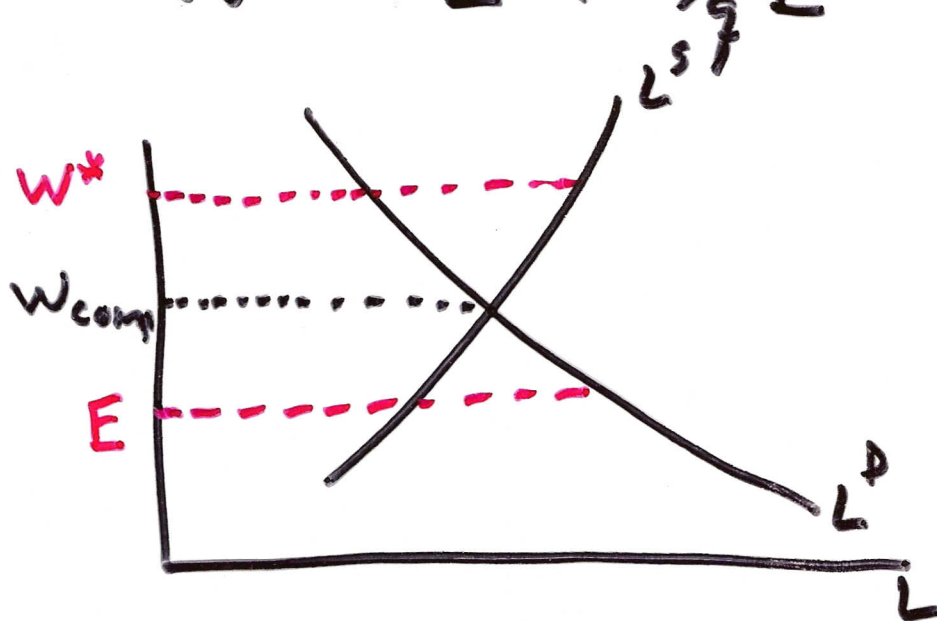
$$V^{\text{work}} = \frac{W - E}{S}$$

$$V^{\text{shirk}} = \frac{W}{S + q}$$

Firm chooses W so that $V^{\text{work}} = V^{\text{shirk}}$

$$\frac{W - E}{S} = \frac{W}{S + q}$$

$$\Rightarrow W^* = E + \frac{S}{q} E$$



Criticisms of Shirking Model

1.) General Equilibrium.

Everyone can't pay above average wages!

Soln: Unemployment becomes the disincentive

2.) More efficient ways to handle potential shirking