

The Labor Market and Unemployment

Intermediate Macroeconomics - UCLA - Econ 102

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Section 1

The Labor Market and Unemployment

Unemployment is no respecter of class or rank - Samuelson (1948)

When, and if, the next great depression comes along, any one of us may be completely unemployed—without income or prospects. Or if not totally unemployed, only partially employed at reduced hours and pay in an uninteresting dead-end job, without hope of advancement or assurance of keeping even what little we have. There is no vaccination or advance immunity from this modern-day plague. It is no respecter of class or rank. Neither veteran's preference nor go-getter pep talks nor advanced degrees can guarantee a job when whole factories are shutting down and when every industry is contracting production and employment.

Unemployment is not only an economic problem - Samuelson (1948)

From a purely selfish point of view, then, it is desirable to gain understanding of the first problem of modern economics: the causes on the one hand of unemployment, overcapacity, and depression; and on the other of prosperity, full employment, and high standards of living. But no less important is the fact—clearly to be read from the history of the twentieth century—that the political health of a democracy is tied up in a crucial way with the successful maintenance of stable high employment and living opportunities. It is not too much to say that the widespread creation of dictatorships and the resulting World War II stemmed in no small measure from the world's failure to meet this basic economic problem adequately.

High unemployment represents a waste of resources so colossal that no one truly interested in efficiency can be complacent about it. It is both ironic and tragic that, in searching out ways to improve economic efficiency, we seem to have ignored the biggest inefficiency of them all.

— *Alan Blinder, Hard Heads, Soft Hearts (1987)*¹

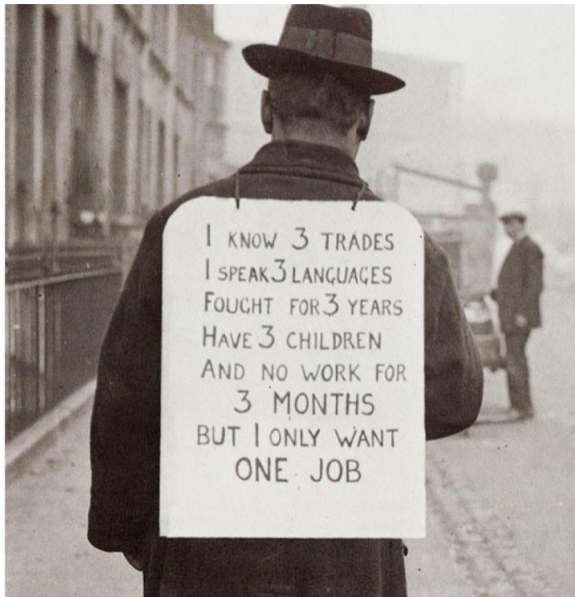
Free Soup



Please Give my Dad a Job



I only want one job



Buy apples



We want work



Buy tangerines



We can't take care of our own



Free Food for Children of Unemployed



Neoclassical and Keynesian economics

- This lecture on the labor market is a transition between neoclassical and Keynesian economics.
- There are three views of the labor market:
 - ① A **neoclassical** view of the labor market: unemployment results from *optimal* market forces.
 - ② One “**sticky-price**,” “**Keynesian**” view of the labor market: wages and prices are “sticky,” and that is where involuntary unemployment comes from. Some people would like to work at the current wage but do not. Indeed, periods of high and persistent *involuntary* unemployment suggest that neoclassical economics is far from being the full story.
 - ③ One **over-saving, Keynesian** view of the labor market: in the next few lectures, we shall develop a view of unemployment based on the imbalance between saving and investment what is called the “paradox of thrift.”

Section 2

Data on Labor Market Slack

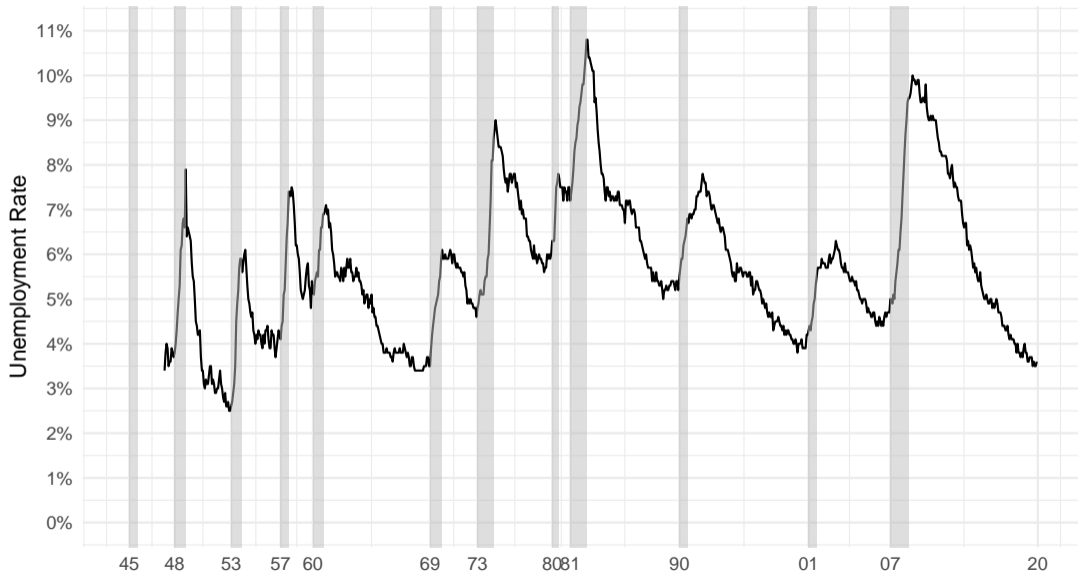
Several notions of labor market “slack”

There are many different notions of labor market “slack” (that is, people who would like to work but do not):

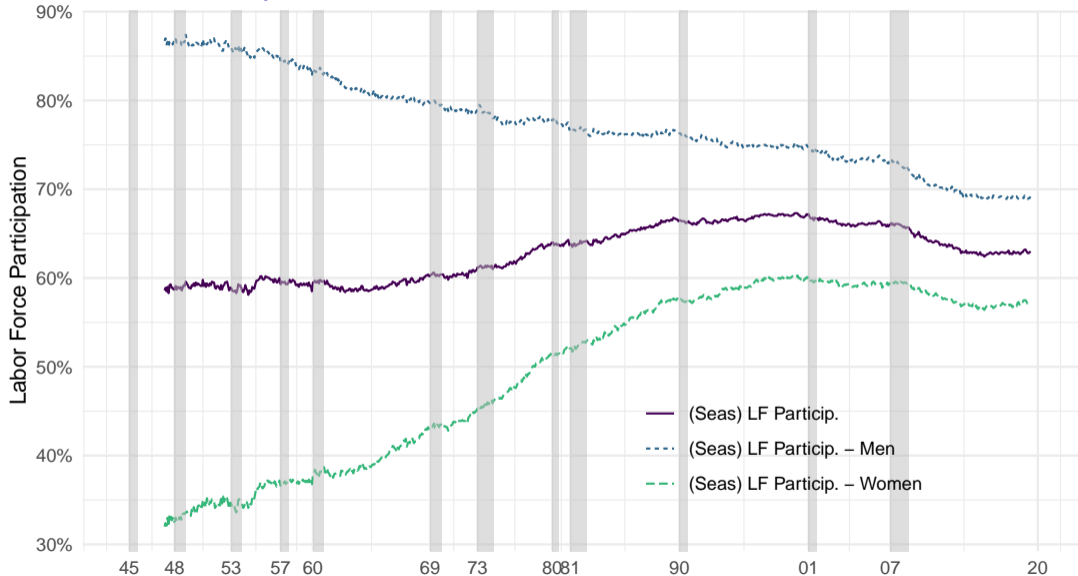
- 1 **Unemployment Rate.** Definitions vary across countries, and are not uncontroversial. (typically tied to unemployment benefits: are you looking for work?)
- 2 **Labor Force Participation.** Advantage is it does not rely on people’s statements. Disadvantage is it depends on how one defines the labor force (age), when people choose to retire, etc.
- 3 **Prime-Age Labor Force Participation (25-54 years).** This is less sensitive to how long people stay in college, and when they choose to retire.

All of this is however very debated.

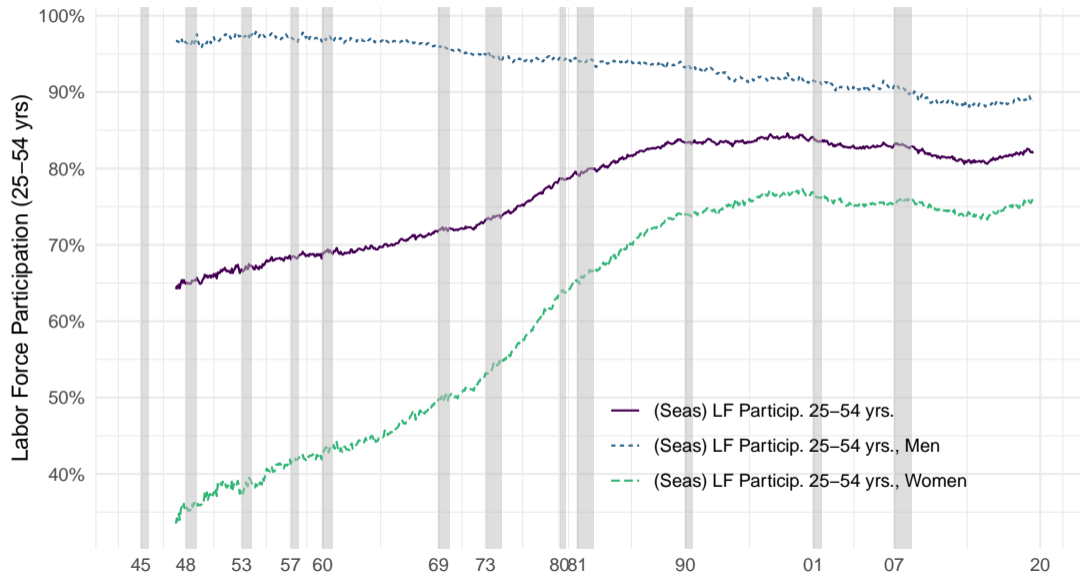
Unemployment Rate



Labor Force Participation



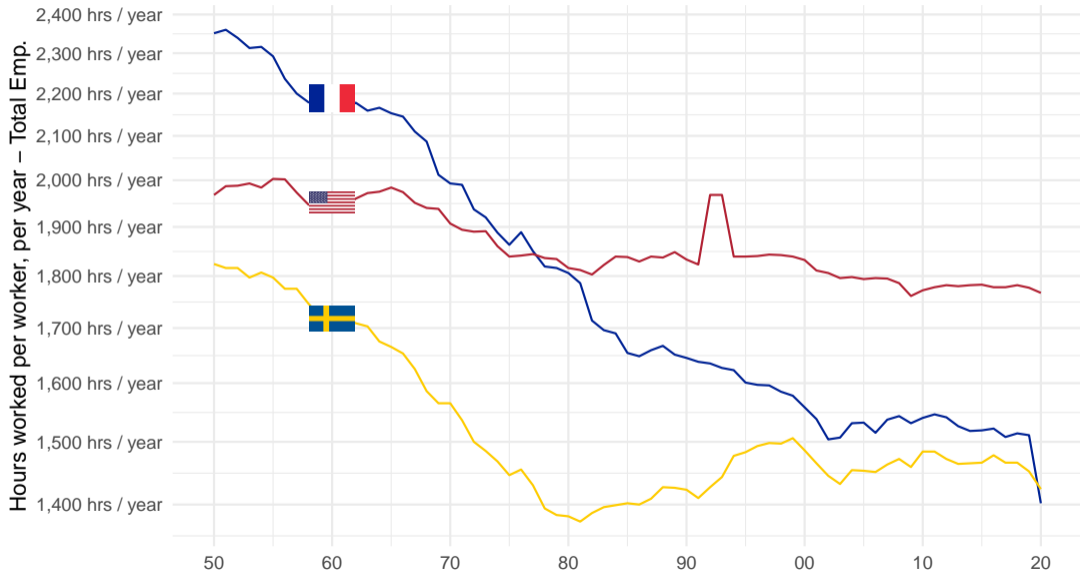
Labor Force Participation (25-54 years)



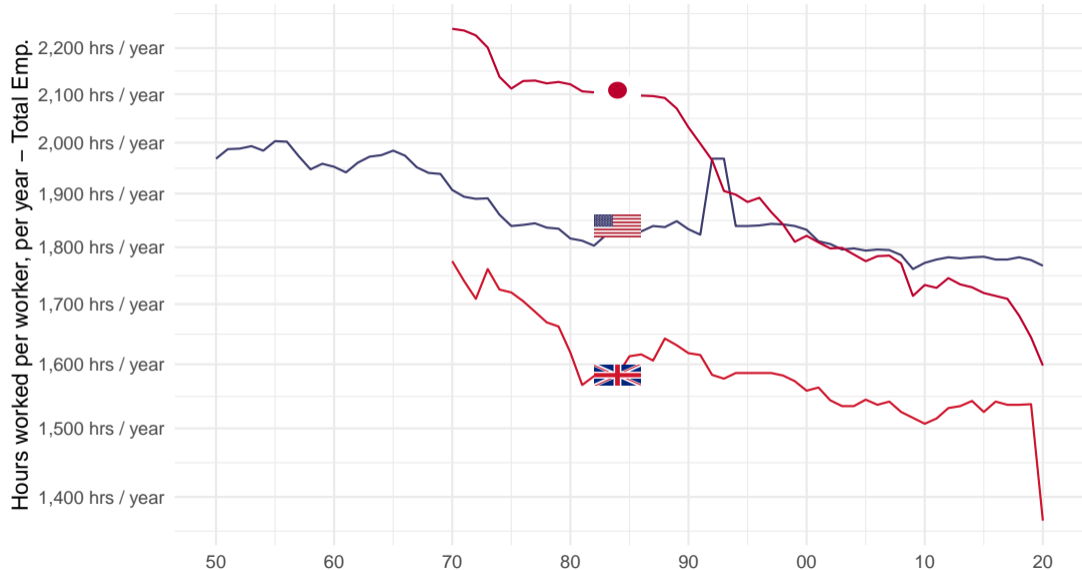
Section 3

Hours of work per year

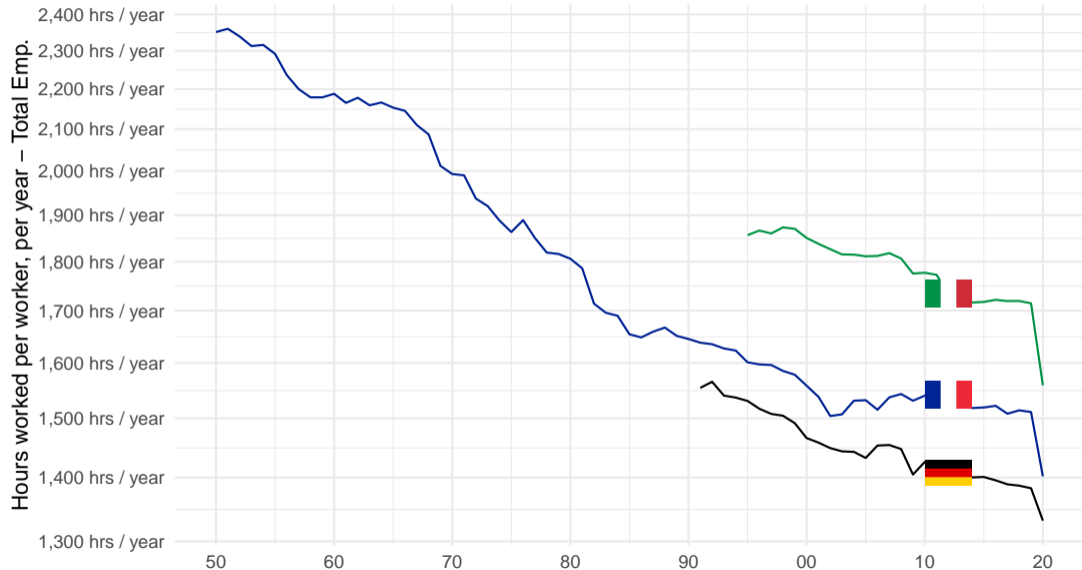
France, Sweden, United States



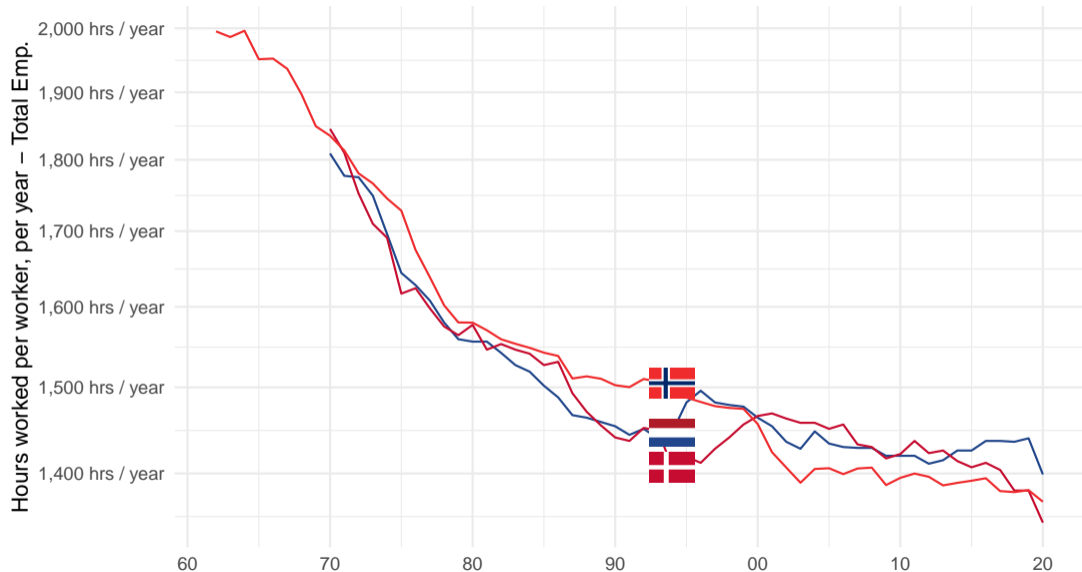
Japan, UK, US



France, Germany, Italy



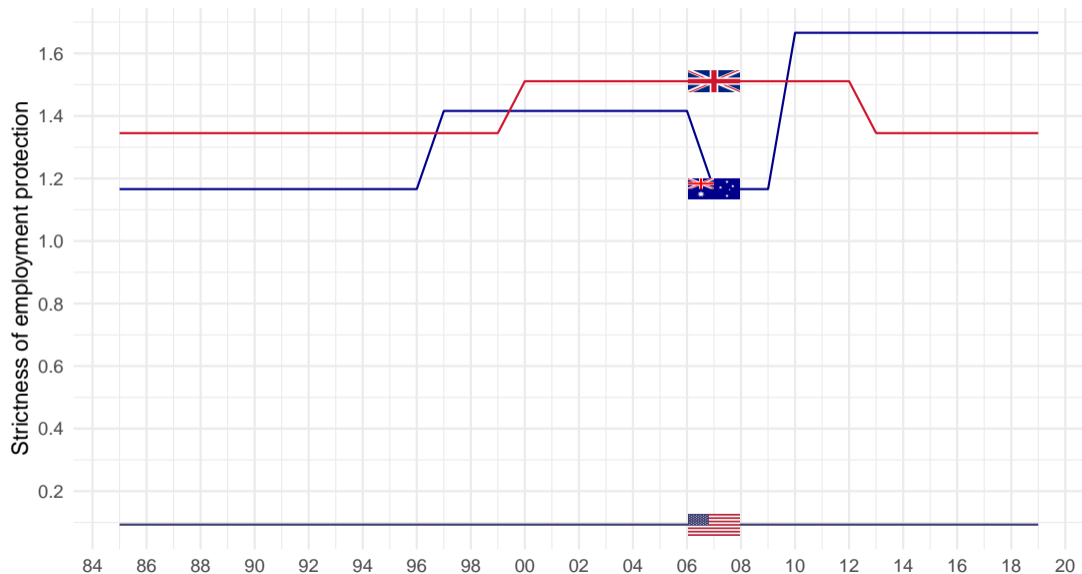
Denmark, Netherlands, Norway



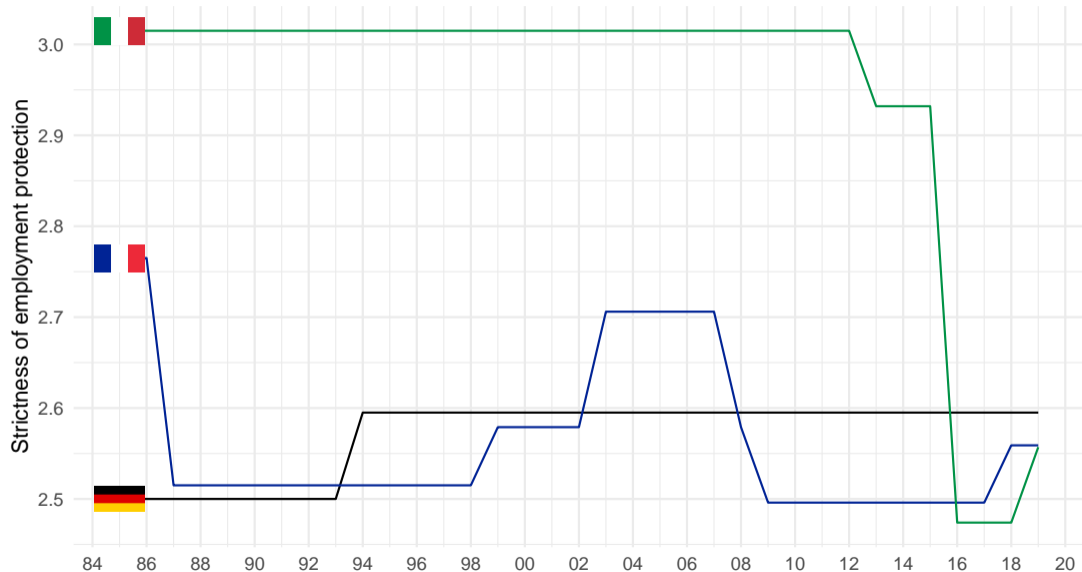
Section 4

Strictness of Employment Protection

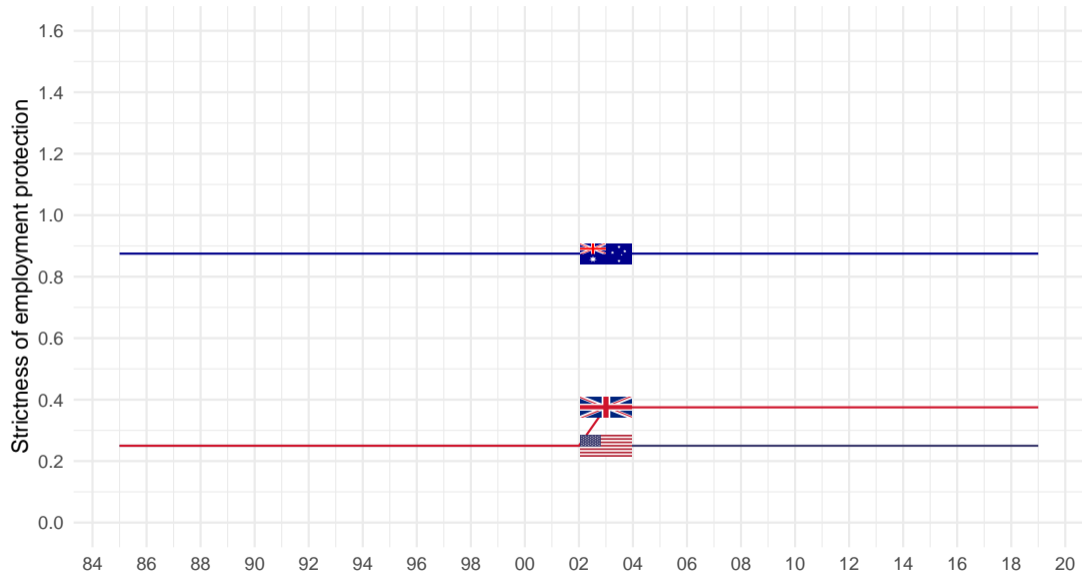
Regular Contracts: Anglo-Saxon



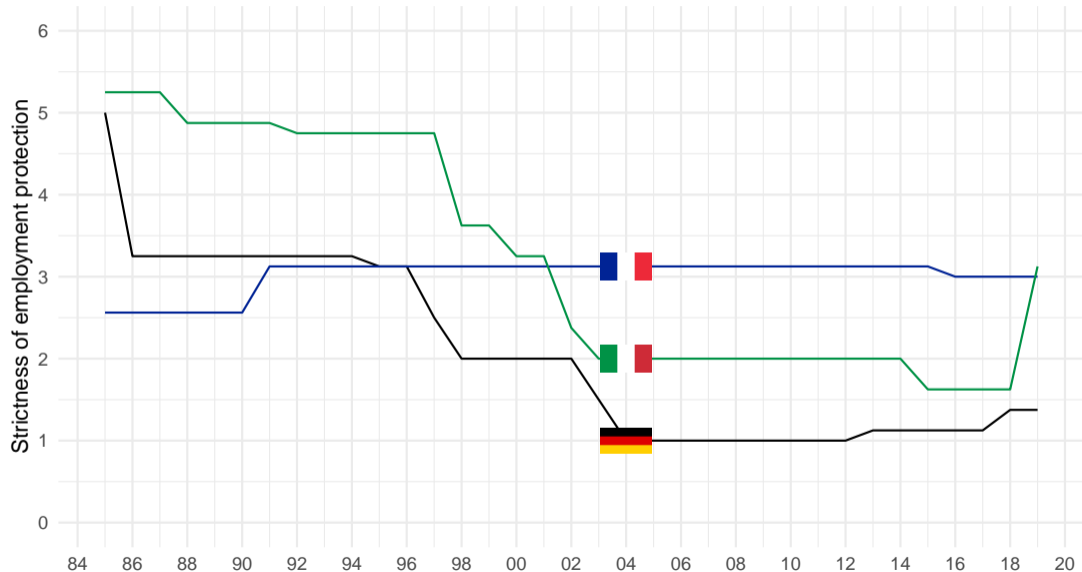
Regular Contracts: European



Temporary Contracts: Anglo-Saxon



Temporary Contracts: European



Section 5

Labor Market Model

Labor Demand

- Firms hire labor at price w .
- Sell the consumption good at price p .
- Assume **decreasing returns** to scale with respect to labor (think for example, that the quantity of capital is fixed):

$$y = f(l).$$

- Firms maximize their profits, and therefore solve:

$$\max_l \quad pf(l) - wl.$$

Labor Supply: Assumptions

- Neoclassical theory of labor supply starts from a static problem of a consumer-worker choosing how much to work, and how much to consume.
- For example, assume that utility is strictly increasing in consumption, and strictly decreasing in the amount of labor supplied:

$$U(c, l) = u(c) - v(l),$$

- Budget constraint of a worker/consumer is given by:

$$pc = wl.$$

Labor Supply: Assumptions

- You may think of w as the hourly wage, for example \$15/hour.
- Then l would be expressed in terms of the number of hours.
- **Warning:** Labor Supply and Labor Demand are sometimes being mixed up.
 - ▶ In the language of microeconomics, workers supply labor, and firms demand labor.
 - ▶ What workers do demand is jobs, or job vacancies, which are supplied by firms.

Fundamental postulate of neoclassical economics

- Labor demand shown above leads to the following first-order condition:

$$pf'(l) - w = 0 \quad \Rightarrow \quad \boxed{f'(l) = \frac{w}{p}}.$$

- Marginal product of labor (MPL) - that is, how much is gained from using one more unit of labor in production $f'(l)$ - needs to be equal to how much that additional unit of labor costs to the firm, the real wage w/p .
- J.M. Keynes calls it the **first fundamental postulate of classical economics** in Chapter 2 of the General Theory. “The utility of the wage when a given volume of labour is employed is equal to the marginal disutility of that amount of employment.”

Fundamental postulate of neoclassical economics

- The problem of the consumer consists in maximizing utility under his budget constraint:

$$\begin{aligned} \max_{c,l} \quad & u(c) - v(l), \\ \text{s.t.} \quad & p \cdot c = w \cdot l. \end{aligned}$$

Again, similarly to the consumption optimization problem, you may solve this optimization in four different ways.

Method 1

- You may compute the ratio of marginal utilities (the marginal rate of substitution between consumption and labor).
- State that it is equal to minus the real wage (because labor slackens the intertemporal budget constraint, and it appears on the right hand-side of the equal sign):

$$\frac{\partial U / \partial l}{\partial U / \partial c} = -\frac{w}{p} \Rightarrow \boxed{\frac{v'(l)}{u'(c)} = \frac{w}{p}}$$

Method 2

- You may apply the following intuitive economic argument.
- The marginal disutility from supplying one more unit of labor is $v'(l)$, for a worker already supplying l units of them. The marginal utility which is gained from doing so is given by the number of additional units of consumption one gets out of it, given by the real wage w/p , and by how much I value each one of these additional utilities of consumption is valued, given by marginal utility $u'(c)$.
- The total gain in utility from consumption is the unit value $u'(c)$ times the number of units w/p , which gives the result:

$$v'(l) = \frac{w}{p} u'(c) \quad \Rightarrow \quad \boxed{\frac{v'(l)}{u'(c)} = \frac{w}{p}}$$

Method 3

- You may substitute out l from the budget constraint, and optimize over the choice of consumption:

$$\max_c u(c) - v\left(\frac{p}{w}c\right).$$

- This implies:

$$u'(c) - \frac{p}{w}v'(l) = 0 \quad \Rightarrow \quad \frac{v'(l)}{u'(c)} = \frac{w}{p}.$$

Method 4

- You may substitute out c from the budget constraint, and optimize over the choice of labor:

$$\max_l u\left(\frac{w}{p}l\right) - v(l).$$

- This implies:

$$\frac{w}{l}u'(c) - v'(l) = 0 \quad \Rightarrow \quad \boxed{\frac{v'(l)}{u'(c)} = \frac{w}{p}}.$$

Example

- Assume a Cobb-Douglas production function for $f(l)$, such that:

$$f(l) = Al^{1-\alpha}.$$

- Let us also assume linear utility for consumption (that is, people enjoy increasing utility equally, regardless of whether it is coming from the first dollar or the last one - this assumption is not realistic and is really made for simplicity), as well as a power function of disutility for work:

$$u(c) = c, \quad v(l) = B \frac{l^{1+\epsilon}}{1+\epsilon}$$

- Therefore:

$$U(c, l) = c - B \frac{l^{1+\epsilon}}{1+\epsilon}.$$

Results 1/2

- Using the above functional forms for $u(\cdot)$ and $v(\cdot)$ allows to write:

$$v'(l) = Bl^\epsilon, \quad u'(c) = 1, \quad \Rightarrow \quad Bl^\epsilon = \frac{w}{p}.$$

- Labor supply $L^s(\cdot)$ as a function of the real wage w/p is thus given by:

$$l = \frac{1}{B^{1/\epsilon}} \left(\frac{w}{p} \right)^{1/\epsilon} \equiv L^s \left(\frac{w}{p} \right).$$

Results 2/2

- Moreover, using the above functional form for $f(\cdot)$ allows to write:

$$f'(l) = A(1 - \alpha)l^{-\alpha} \quad \Rightarrow \quad A(1 - \alpha)l^{-\alpha} = \frac{w}{p}.$$

- Labor demand $L^d(\cdot)$ is given as a function of the real wage w/p by:

$$l = A^{1/\alpha}(1 - \alpha)^{1/\alpha} \left(\frac{w}{p}\right)^{-1/\alpha} \equiv L^d\left(\frac{w}{p}\right).$$

Summing up

- To sum up, the neoclassical labor market model is composed of the following labor supply and labor demand equations:

$$L^d \left(\frac{w}{p} \right) = A^{1/\alpha} (1 - \alpha)^{1/\alpha} \left(\frac{w}{p} \right)^{-1/\alpha},$$

$$L^s \left(\frac{w}{p} \right) = \frac{1}{B^{1/\epsilon}} \left(\frac{w}{p} \right)^{1/\epsilon}.$$

- Market clearing implies that labor supply equals labor demand:

$$\begin{aligned} L^d \left(\frac{w}{p} \right) &= L^s \left(\frac{w}{p} \right) \\ \Rightarrow \frac{w}{p} &= (1 - \alpha)^{\frac{\epsilon}{\alpha + \epsilon}} A^{\frac{\epsilon}{\alpha + \epsilon}} B^{\frac{\alpha}{\alpha + \epsilon}}. \end{aligned}$$

Results

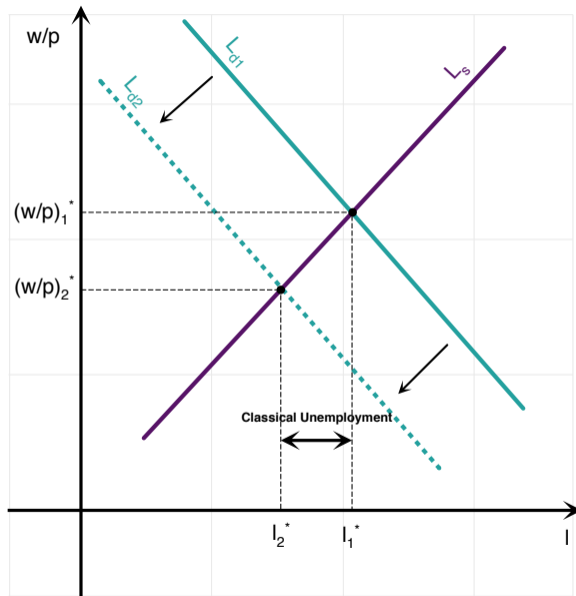
- We may use either labor supply or labor demand in order to express the equilibrium quantity of labor l . For example, let us use labor demand (as an exercise, you may check that using labor supply instead leads to the same expression):

$$\begin{aligned}l &= \frac{1}{B^{1/\epsilon}} \left(\frac{w}{p} \right)^{1/\epsilon} \\&= \frac{1}{B^{1/\epsilon}} (1 - \alpha)^{\frac{1}{\alpha+\epsilon}} A^{\frac{1}{\alpha+\epsilon}} B^{\frac{\alpha}{\epsilon(\alpha+\epsilon)}} \\&= (1 - \alpha)^{\frac{1}{\alpha+\epsilon}} A^{\frac{1}{\alpha+\epsilon}} B^{\frac{\alpha}{\epsilon(\alpha+\epsilon)} - \frac{1}{\epsilon}} \\l &= (1 - \alpha)^{\frac{1}{\alpha+\epsilon}} A^{\frac{1}{\alpha+\epsilon}} B^{-\frac{1}{\alpha+\epsilon}}\end{aligned}$$

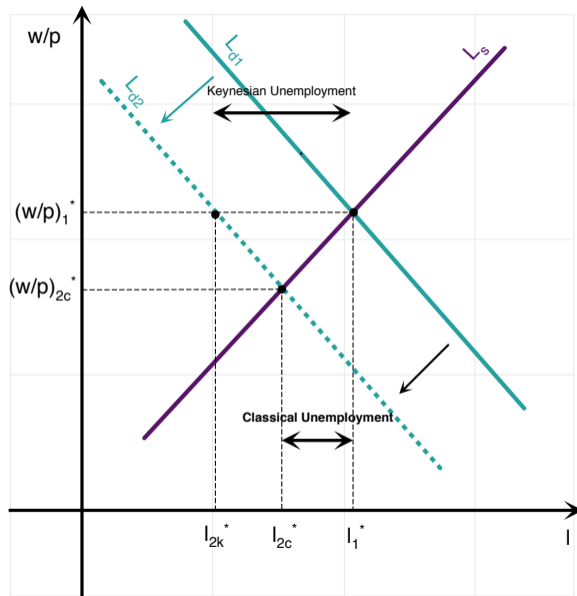
Section 6

Shock to Labor Demand

Neoclassical Model



“Keynesian” Model



Why “Keynesian” - Leijonhufvud (1967)

That a model with wage rigidity as its main distinguishing feature should become widely accepted as crystallizing the experience of the unprecedented wage deflation of the Great Depression is one of the more curious aspects of the development of Keynesianism, comparable in this regard to the orthodox view that “money is unimportant”—a conclusion presumably prompted by the worst banking debacle in U.S. history. The emphasis on the “rigidity” of wages, which one finds in the New Economics, reveals the judgment that wages did not fall enough in the early 1930’s. Keynes, in contrast, judged that they declined too much by far. It has been noted before that, to Keynes, wage rigidity was a policy recommendation and not a behavioral assumption (e.g., [11]).

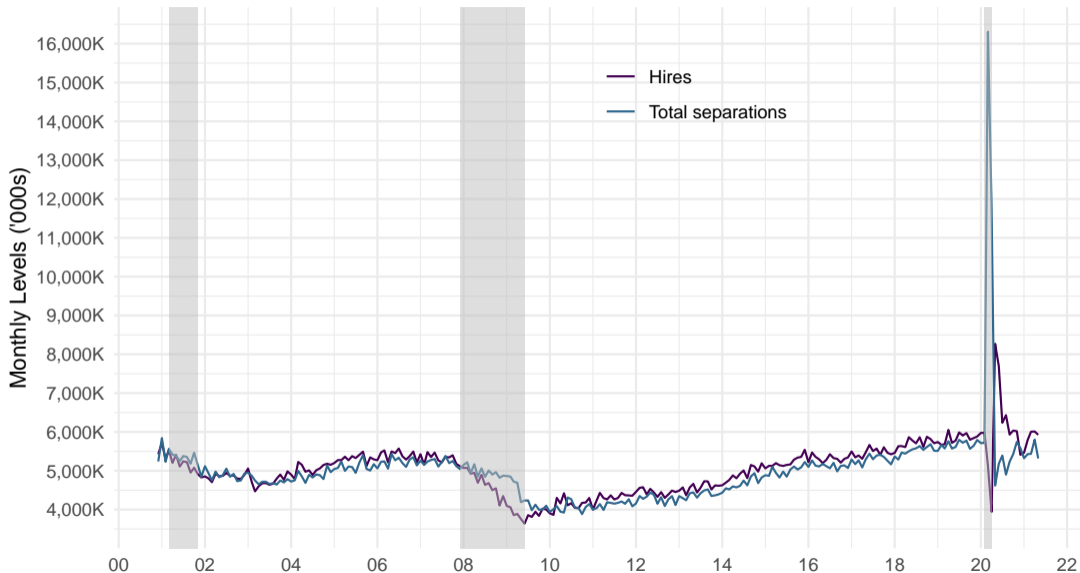
Keynes (1931) - on reducing wages

To decrease the cost of output by reducing wages and curtailing Budget services may indeed increase foreign demand for our goods (unless, which is quite likely, it encourages a similar policy of contraction abroad), but it will probably diminish the domestic demand. The advantages to employers of a *general* reduction of wages are, therefore, not so great as they look. Each employer sees the advantage to himself of a reduction of the wages which he himself pays, and overlooks both the consequences of the reduction of the incomes of his customers and of the reduction of wages which his competitors will enjoy. Anyway, it would certainly lead to

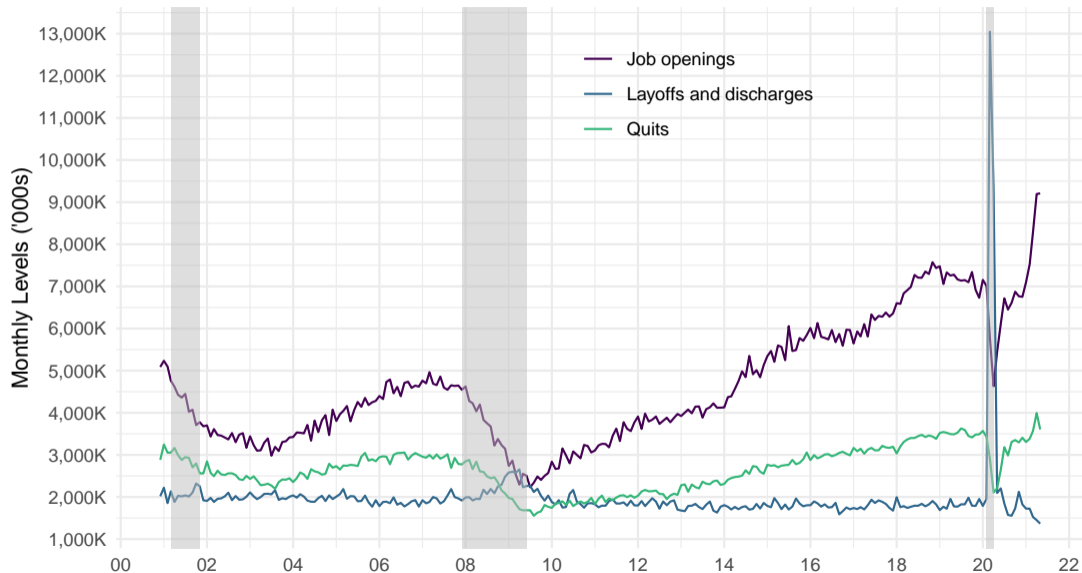
Section 7

Data on Job Flows

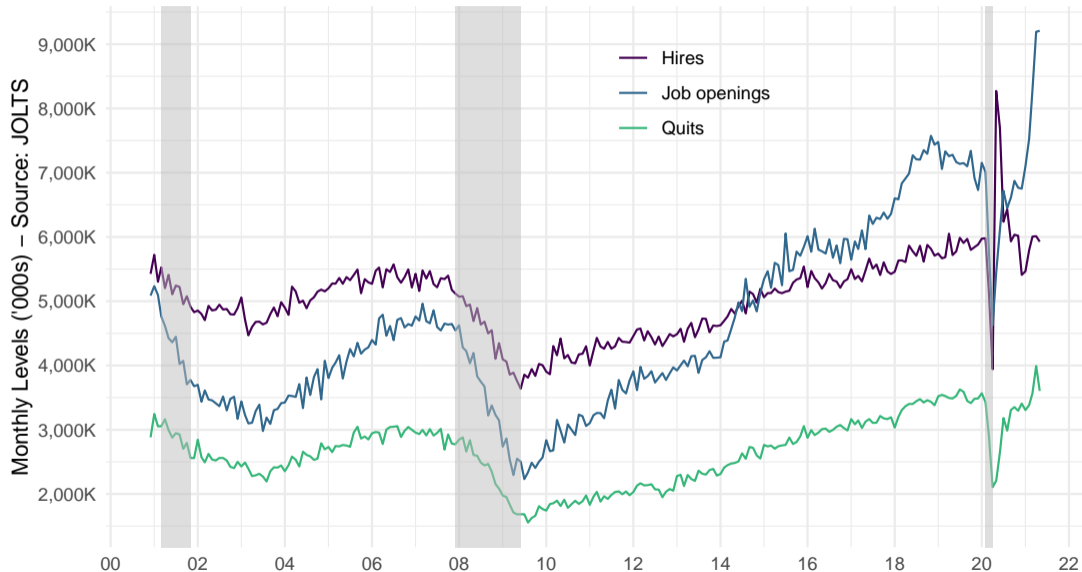
Hires and Separations



Job Openings, Layoffs and Quits



Hires, quits, Openings



Section 8

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Leijonhufvud, Axel. 1967. "Keynes and the Keynesians: A Suggested Interpretation." *The American Economic Review* 57 (2): 401–10. <https://www.jstor.org/stable/1821641>.

Samuelson, Paul A. 1948. *Economics*. New York Toronto London: McGraw-Hill Book Company.