8 – Work, Wages & Unemployment

Extended slides
this is an extended version (much more crowded with text and with additional explanations) of the slides I will project in class. You can use them as lecture notes.

8 – Work, Wages & Unemployment

Study Material for this Section:
Chapter 11 "Work, Wages & Unemployment" from the textbook. In this chapter, you only have to study Sections 11.1, 11.2, 11.6, 11.7, 11.8, 11.9, 11.10 and 11.15. You can skip all other sections.

8 – Jobs, Unemployment and Wages

Takeaways

1. The employment contract is incomplete, because it cannot regulate worker's effort.

2. Employment is a repeated interaction, in which the employer uses the threat of termination to extract effort from the worker.

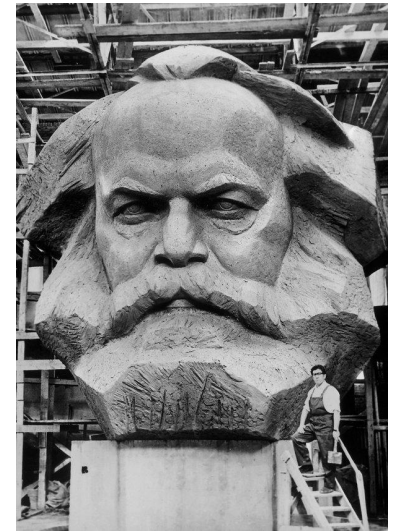3. In the overall economy, the higher the unemployment rate, the lower the wage.

8 – Jobs, Unemployment and Wages

The Plan

1. Employment as a principal-agent relation.

2. The wage curve.

3. The employment rent.

1 - Employment as a principal-agent relation

- Karl Marx first to recognize that the job contract cannot regulate effort intensity.

- Ronald Coase also stressed that relations within the firm are run mostly through power, not purely economic incentives.

- This is because the employment contract is incomplete (as Marx noticed) hidden action → moral hazard.

Employment as a principal-agent relation

- *Employer* as the principal. *Worker* as the agent

- *Incomplete contract*: cannot specify the level of worker's effort.
  - Asymmetric or non-verifiable information
  - Time
  - Measurement

- *Conflict of interest*: Employer wants the employee to work hard, but it's painful for the employee to work hard.

- The 'Benetton model' (Section 7) can be relabeled and applied identically to the job contract:
  - Employer offers a wage *w* and a termination function *t=t(e)*.
  - Worker selects effort level *e* to maximize value, giving rise to a BRF e=e(w)
  - Nash Equilibrium: Employer selects the wage w^N that maximizes effort per dollar e/w, taking into account the worker's BRF e=e(w).
  - Pareto-inefficient; worker gets a rent over his fallback position.

2- The Wage Curve

- A simplified model to more easily grasp the macroeconomic implications of contractual incompleteness in the labor market.

- One-shot sequential game.

- Worker decides whether to work ($e = \bar{e}$) or shirk ($e=0$).

- If she works, she is sure to get wage w.

- If she shirks, with probability t she is detected by employer & fired.

- If she is fired, either she remains unemployed and gets unemployment benefit B (probability j), or she finds a new identical job (probability 1-j).

- Employer wants to find (and implement) the *no-shirking wage* w^N: minimum wage rate that must be offered in order to induce the worker not to shirk.

Employer: Sets wage w

Worker's choice: Does not work $e = 0$ | Works $e = \underline{e}$

Chance: Worker is terminated (t) | Worker keeps job $(1 - t)$
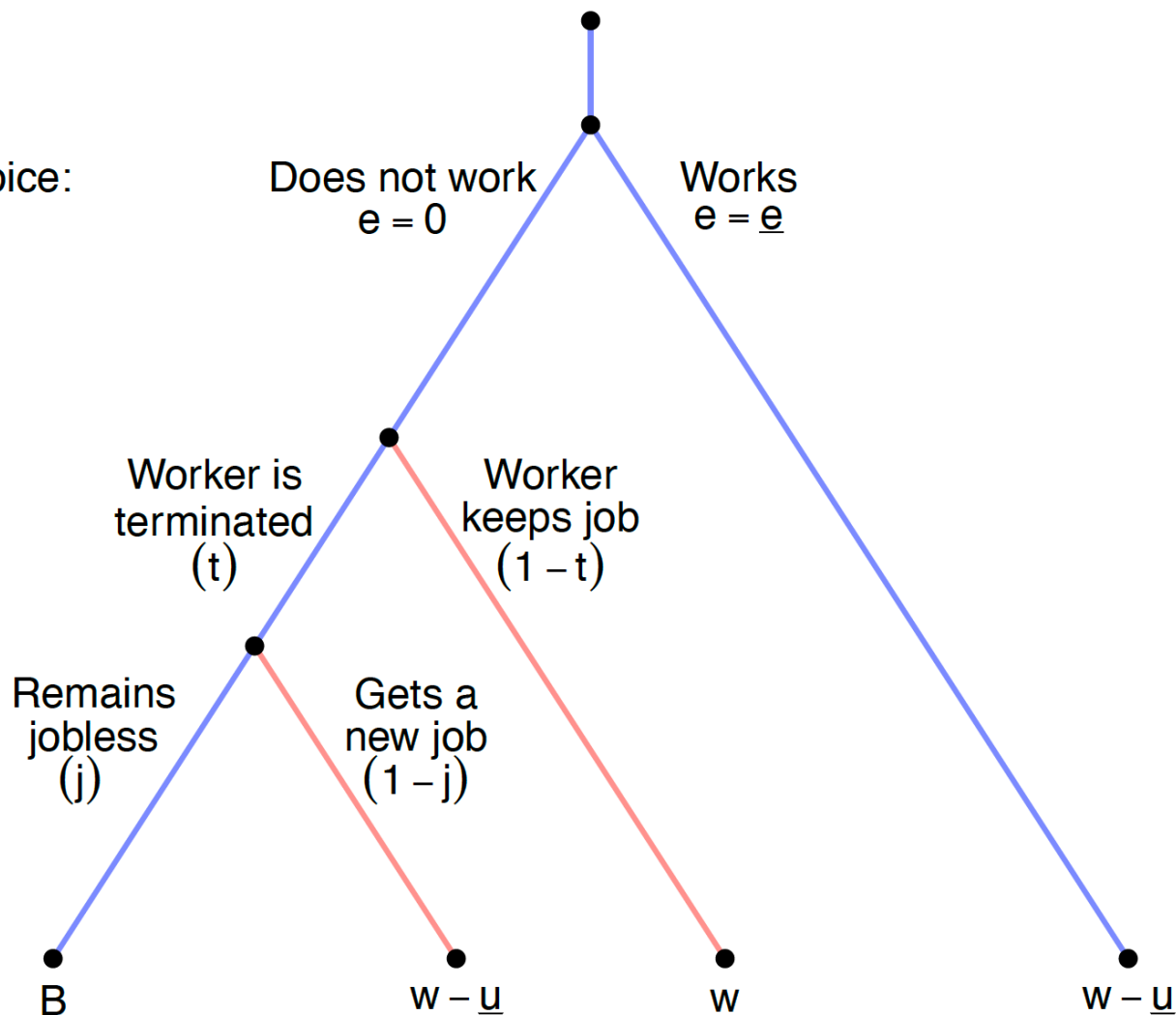
Chance: Remains jobless (j) | Gets a new job $(1 - j)$

B | $w - \underline{u}$ | w | $w - \underline{u}$

The no-shirking condition (1/2)

- If the employee works $(e = \bar{e})$, she gets the wage w minus the disutility of effort $\underline{u}$
  - payoff: $w - \underline{u}$.

- If the employee shirks, 3 possibilities:
  1. she is not caught and gets the wage
     - payoff: w; probability: $1 - t$.
  2. she is caught but finds another identical job and gets the expected value of a job
     - payoff: $w - \underline{u}$ (will become clear later why); probability: $t * [1 - j]$.
  3. she is caught and remains unemployed, getting unemployment benefit B
     - payoff: B; probability: $t * j$.

The no-shirking condition (2/2)

- Payoff from working $(e = \bar{e})$:
$$w - \underline{u}$$

- Expected payoff from shirking $(e = 0)$:
$$(1 - t)w + tjB + t(1 - j)(w - \underline{u})$$

- No shirking condition: employee will not shirk if
$$w - \underline{u} \geq (1 - t)w + tjB + t(1 - j)(w - \underline{u})$$

   – *The employee will choose to work (not shirk) if the payoff from working is greater than the expected payoff from shirking.*

The equilibrium (no-shirking) wage

- No-shirking condition: employee will not shirk if

$$w - \underline{u} \geq (1 - t)w + tjB + t(1 - j)(w - \underline{u})$$

- Rearranging: $w \geq B + \underline{u} + \frac{1-t}{tj}\underline{u}$

- No-shirking wage: $w^N = B + \underline{u} + \frac{1-t}{tj}\underline{u}$

  - w^N is the minimum wage required to induce the employee to work

  - the employer will set this wage (Nash Equilibrium of the sequential game).

- Factors affecting the wage:

  - Unemployment benefits B (+)

  - Disutility of effort $\underline{u}$ (+)

  - Probability that shirking is detected t (-)

  - Probability that a terminated worker remains jobless j (-)

The equilibrium (no-shirking) wage

- No-shirking condition: employee will not shirk if

$$w - \underline{u} \geq (1 - t)w + tjB + t(1 - j)(w - \underline{u})$$

- Rearranging: $w \geq B + \underline{u} + \frac{1-t}{tj}\underline{u}$

- No-shirking wage: $w^N = B + \underline{u} + \frac{1-t}{tj}\underline{u}$

  - w^N is the minimum wage required to induce the employee to work

  - the employer will set this wage (Nash Equilibrium of the sequential game).

NOTE: By setting this wage, the employer makes the payoff from working equal to the expected payoff from shirking:
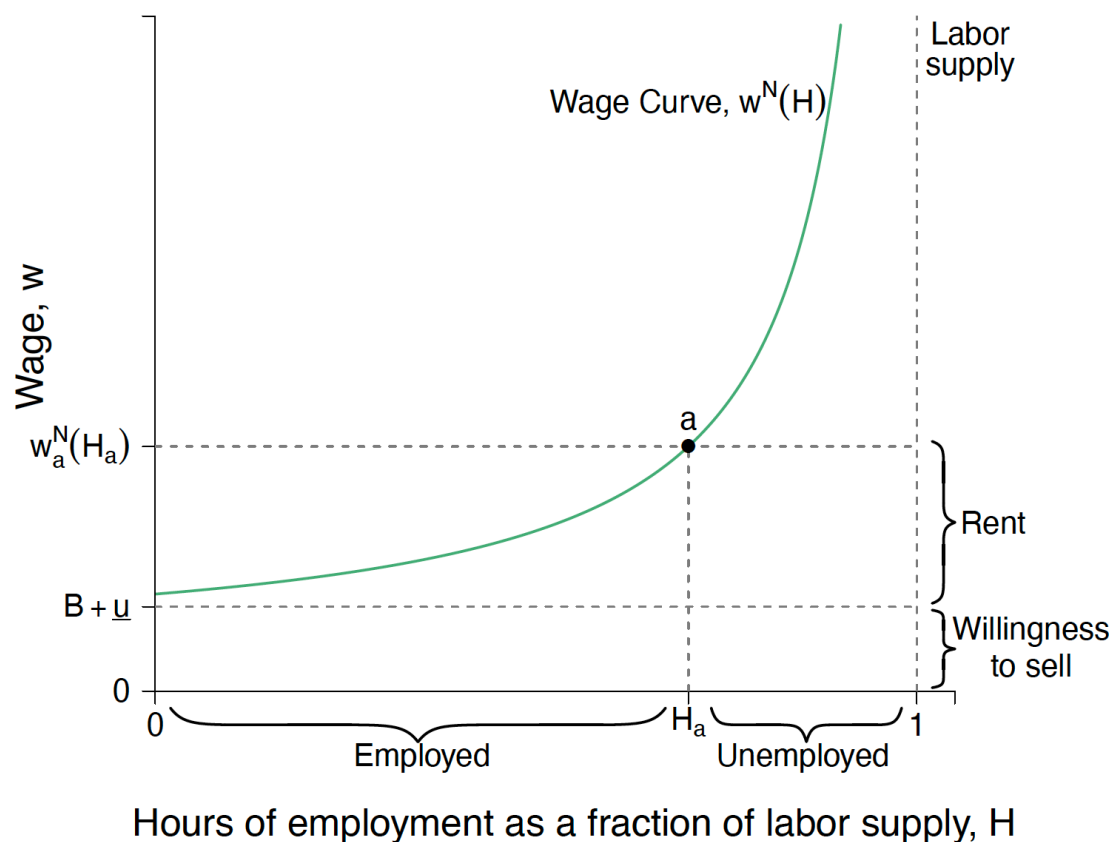
$w - \underline{u} = (1 - t)w + tjB + t(1 - j)(w - \underline{u})$

But then the payoff from having a job, whether you will shirk or not, is always equal to $w - \underline{u}$.

That's why, in computing the expected payoff from shirking, we set the payoff that a worker gets from another identical job equal to $w - \underline{u}$.
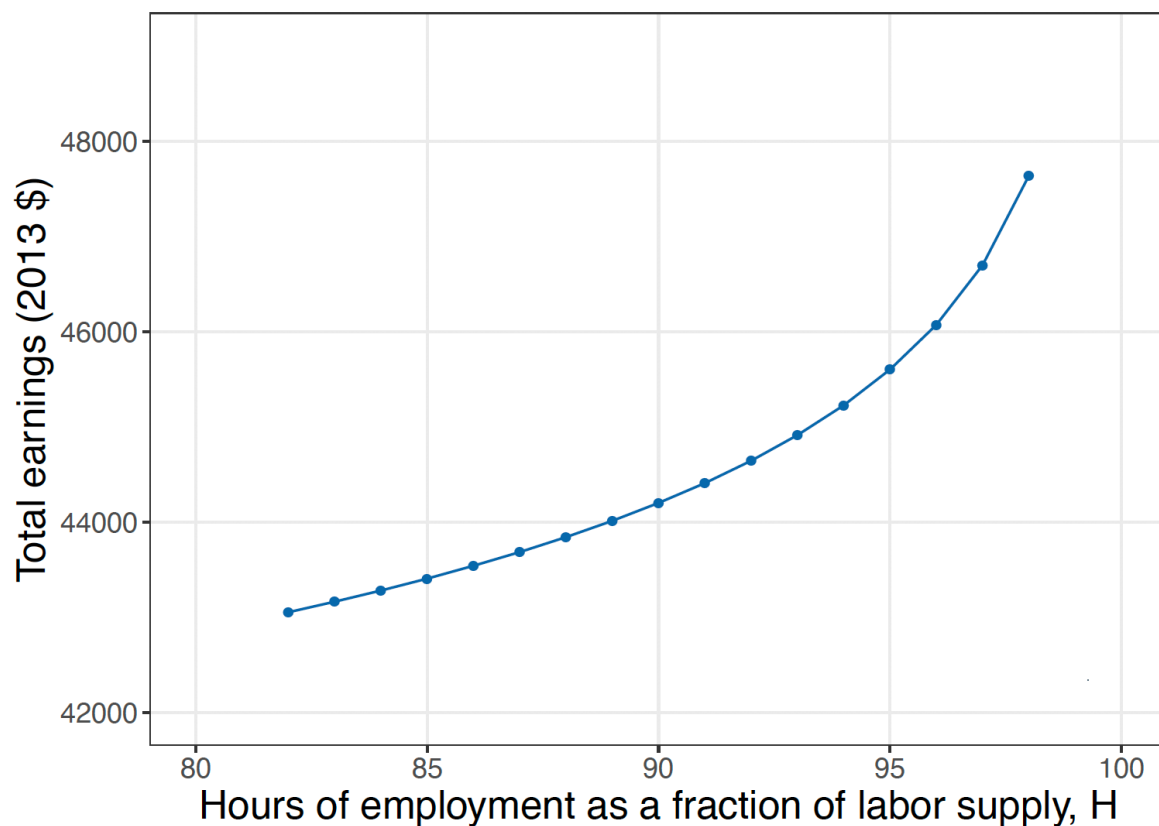
The Wage Curve

higher employment (or lower unemployment) → Lower j →higher wages

Hours of employment as a fraction of labor supply, H

The Wage Curve

The wage curve in the US, estimated using survey data

3 – The Employment Rent

- Employees get a rent: workers' payoff > fallback position.

  - workers' payoff: $w^N - \underline{u}$

  - worker's fallback option: B

  - Worker's rent: $w^N - \underline{u} - B = \left(\frac{1-t}{t}\right)\frac{\underline{u}}{j}$

- If effort gets harder to observe (lower t):

  - Worker's rent go up.

  - Profits go down (because of higher wages paid).

  - A manifestation of the fact that *in a principal-agent relation, contractual incompleteness favors the agent*.