

# Econ 200C

Joel Sobel

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# Analysis

Informally: The equilibrium outcome is the highest competitive market wage.

More formally: Let  $\bar{w}$  be the highest competitive market wage and let  $\underline{t}$  be the lowest type.

Either:  $\bar{w} = r(\underline{t})$ , in which case the market shuts down (wages are not determined in equilibrium, but they must be no higher than  $\bar{w}$ ) or: There is a unique subgame perfect equilibrium in which firms offer  $\bar{w}$  provided a regularity condition holds. A sufficient condition for the result is that  $E[t \mid r(t) \leq w] > w$  for  $w$  slightly less than  $\bar{w}$ . The regularity condition says that you cannot have an equilibrium with wages slightly below  $\bar{w}$ .

The condition will be satisfied if  $E[t \mid r(t) \leq w] - w$  is strictly decreasing at  $\bar{w}$ . (We know that it is weakly decreasing.)

# Interpretation

Adding strategic power rules out low activity (low wage) equilibria, but does not eliminate adverse selection.

# Argument

If  $\bar{w} = r(\underline{t})$ , then  $E[t \mid r(t) \leq w] < w$  for all  $w$ , so no firm will offer more than  $\bar{w}$  (else it will make negative profits).

If  $\bar{w} > r(\underline{t})$ ,

1. Zero profits in equilibrium. (Usual argument: if positive profits, the less well off firm can raise wage by a little bit and capture essentially all profits.)
2. Highest wage must be  $\bar{w}$ . (Else deviate to just below  $\bar{w}$ . This is profitable by the regularity condition.)
3. All must charge  $\bar{w}$ . (Otherwise high price firm can lower wage.)
4. Indicated strategies are an equilibrium. (Higher wages can't be profitable by the definition of  $w^*$ .)

## Inefficiency and Intervention

We know that the equilibria in adverse selection models are inefficient: If there was complete information, it would be possible to make everyone better off.

When there is incomplete information, this is the wrong notion of efficiency (because it does not respect constraints imposed by private information).

Think of an allocation generally as  $(p(t), w(t))$  as describing the probability that a type  $t$  agent is employed and the agent's wage. This allocation gives worker  $t$  utility  $U(t) = (1 - p(t))r(t) + w(t)$ . This allocation is incentive compatible (respects private information) if  $U(t) \geq (1 - p(t'))r(t) + w(t')$ , that is if it is not in  $t$ 's interest to pretend to be  $t'$ .

This generality is sometimes important, but here let us restrict attention to  $p(t) = 1$  or  $0$ . In this case workers are either employed or unemployed and  $w(t)$  must be constant, equal to say  $w_e$  for all employed types and constant, equal to say  $w_u$  for the others. It is consistent with the incentives to pay unemployment compensation, but not to distinguish between different employed types.

## Best Competitive Outcome is Constrained Efficient

Assume that  $r(\cdot)$  is strictly increasing and  $r(t) \leq t$  for all  $t$ . If the density of  $t$  is positive over its support, then the highest wage competitive equilibrium is constrained efficient.

This is a result. Continue for context.

# Discussion

- ▶ General Equilibrium: Main result equilibria are efficient.
- ▶ First insight from adverse selection: A simple model in which competitive equilibrium is not efficient.
  1. When inefficient?: In cases where  $r(t) < t$  for all  $t$ , but in competitive equilibrium not all workers active.
  2. When does this happen?: For example in Akerlof example:  $r(t) = \alpha t$ ,  $\alpha \in (.5, 1)$
  3. How can this happen? Assumptions of 200B theorem not satisfied (incomplete information).
  4. How can this happen? To obtain full participation, must pay top worker  $t = 1$  at least  $r(1)$ , but expected productivity is not  $t = 1$ 's productivity, but the expected productivity of all workers.

- ▶ Second insight from adverse selection: Giving firms market power does not necessarily lead to efficiency. (Instead it selects the highest-wage competitive equilibrium, which still may be inefficient.)
- ▶ With incomplete information, looking at a constrained notion of efficiency may be appropriate.
- ▶ Strategic model does provide a constrained efficient allocation.

# Argument

What allocations can be constrained efficient?

1. Some workers unemployed (else highest wage competitive equilibrium is fully efficient because  $r(t) \leq t$ ).
2. Interior type  $\tilde{t}$  indifferent between work and not. Below employed; above not. Since

$$w_u + r(\tilde{t}) = w_e$$

monotonicity of  $r(\cdot)$  implies the claim.

3. Budget balance:  $w_e F(\tilde{t}) + w_u(1 - F(\tilde{t})) = \int_{\underline{t}}^{\tilde{t}} \theta dF(\theta)$
4.  $w_u(\tilde{t}) = \int_{\underline{t}}^{\tilde{t}} \theta dF(\theta) - r(\tilde{t})F(\tilde{t})$
5.  $w_e(\tilde{t}) = \int_{\underline{t}}^{\tilde{t}} \theta dF(\theta) + r(\tilde{t})(1 - F(\tilde{t}))$

Aside: so one can obtain the highest (or any) competitive equilibrium without unemployment payments.

## Continued

It is not possible to improve things for everyone by picking a cutoff different from the highest competitive one. Let  $t^*$  denote the competitive cut off.

If  $t^* > \tilde{t}$ , then  $w_e(\tilde{t}) < r(t^*)$  so that employed agents are worse off (relative to the competitive equilibrium)

If  $t^* < \tilde{t}$ , then  $w_u(\tilde{t}) < 0$ , so unemployed workers are made worse off (relative to the competitive equilibrium).

Both claims require a bit of algebra to justify.