

Redistribution as optimal social insurance

- We now shift focus to the role of fiscal policy in redistributing income from the rich to the poor. To start with, we will take a normative perspective to redistribution. Think of agents “behind the veil of ignorance”, that is, before they know whether they will be relatively talented/lucky/rich or relatively untalented/unlucky/poor. To the extent that agents dislike income risk, they would like to insure against the possibility that they happen to be untalented/unlucky/poor. Redistribution can then be viewed as a way to achieve this kind of insurance. In other words, when the government redistributes income from the rich to the poor, the government plays, at least in part, the role of an insurance agency.
- Ex post (say, at middle age), it might be painful for the rich to give out part of their income. But ex ante (say, at birth), before agents know whether they will end up being rich or poor, redistribution offers insurance against the risk of ending up poor. In so doing, redistribution may be socially desirable ex ante, even if ex post it is politically complicated.
- Here, we assume away the political aspects of redistribution and focus on its role as optimal social insurance.

- Simple, two-period model. Agents live only two period. During the first period, all agents are identical and the economy makes a single choice: it sets up a tax-and-redistribution system. In the second period, different agents get different realization of “luck” (random income), decide how much to work, and consume.
- Household preferences:

$$u_i = u(c_i, n_i) = - \exp \left\{ - \left(c_i - \frac{1}{1+\epsilon} n_i^{1+\epsilon} \right) \right\}$$

where c_i is consumption and n_i is effort/labor supply

- Household budget:

$$c_i = (1 - \tau)y_i + T$$

where τ is the tax rate on income and T is a lump-sum transfer.

- Income is given by

$$y_i = n_i + \nu_i$$

where ν_i is a random variable, drawn from a Normal distribution with mean 0 and variance σ^2 .

- Substituting the budget and the income into the household's utility we get

$$u_i = -\exp \left\{ - \left[(1 - \tau)(n_i + \nu_i) + T - \frac{1}{1+\epsilon} n_i^{1+\epsilon} \right] \right\}$$

Taking the FOC with respect to n_i gives the optimal effort as a decreasing function of the tax rate:

$$n_i = (1 - \tau)^{1/\epsilon}$$

Note that ϵ , which parameterizes the elasticity of labor supply to the wage, controls the distortionary effect of taxation: the higher the elasticity of labor supply, the stronger the negative effect of higher taxes on labor supply.

- For simplicity, I henceforth let $\epsilon = 1$, so that

$$n_i = n = 1 - \tau$$

for all i .

- The government budget is given by

$$G + T = \tau \int y_i di,$$

where G is the exogenous level of government spending.

- Using the fact that all agents choose $n_i = n = (1 - \tau)$ and that the average realization of luck ν_i is zero, we get

$$T = \tau(1 - \tau) - G$$

- Note here that there is a Laffer curve: tax revenue increases with the tax rate τ as long as the tax rate is low enough (here, $\tau < 1/2$), but it decreases once the tax rate exceeds a threshold.

- Substituting these results into the household's income we get

$$u_i = -\exp \left\{ - \left[\frac{1}{2}(1 - \tau)^2 + (1 - \tau)\nu_i + \tau(1 - \tau) - G \right] \right\}$$

- Consider now the expected utility of agent from the perspective of the first period, before the realization of luck is known. Note that ν_i is Normally distributed with zero mean and variance σ^2 . Next, recall that if x is a Normally distributed random variable, then

$$\mathbb{E}[\exp(x)] = \exp \left(\mathbb{E}[x] + \frac{1}{2} \text{Var}[x] \right)$$

Using these fact we conclude that the ex-ante utility of the household behind the veil of ignorance is given by

$$\mathbb{E}[u_i] = -\exp \left\{ - \left[\frac{1}{2}(1 - \tau)^2 - \frac{1}{2}(1 - \tau)^2\sigma^2 + \tau(1 - \tau) - G \right] \right\}$$

- Note that the above is decreasing in σ , reflecting risk aversion (or, equivalently, inequality aversion). By the same token, an increase in τ can help increase ex-ante welfare in so far it reduces exposure to random income risk.

- Now suppose that τ is chosen so as to maximize the ex-ante utility of the typical agent, as seen behind the veil of ignorance. Clearly, τ must maximize

$$\frac{1}{2}(1 - \tau)^2 - \frac{1}{2}(1 - \tau)^2\sigma^2 + \tau(1 - \tau)$$

It is then straightforward to check that the optimal τ increases with σ : the higher the randomness/inequality in income, the higher the value of insurance, and the higher the optimal level of redistribution.

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