

Public Economics (ECON 131)

Section #12: Unemployment Insurance

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1 Main Insurance Types

- **Unemployment Insurance (UI):** Pays benefits to workers who have been laid off
 - Federally mandated, state run
 - Each state determines benefits and rules
 - Funded through payroll taxes on employers (1-2%)
 - **Experience Rating:** the payroll tax amount depends partly on the burden the employer has placed on the UI system – i.e. payments increase after the firm lays off more workers.
 - **Replacement rate:** the share of previous earnings earned under UI. $R = B/W$, ranges from 35-55%
 - In general, can collect UI for 6 months
- **Disability Insurance (DI):** Pays benefits to workers who have suffered a medical impairment that leaves them permanently unable to work
 - Funded through Social Security payroll tax
 - Applicants screened by social security examiners
- **Workers compensation (WC):** Pays for medical costs and lost wages associated with an on-the-job injury
 - State-mandated
 - Purchased by firms from private insurers
 - Payments untaxed → replacement rate close to 90% on average

2 Practice Problem

2.1 UI question from 2015 final exam

Individuals have utility function given by $U(C) = \sqrt{C}$.

Individuals earn a wage w when employed and have no earnings when unemployed.

The probability of being unemployed is q .

(a) Write down the individuals' expected utility

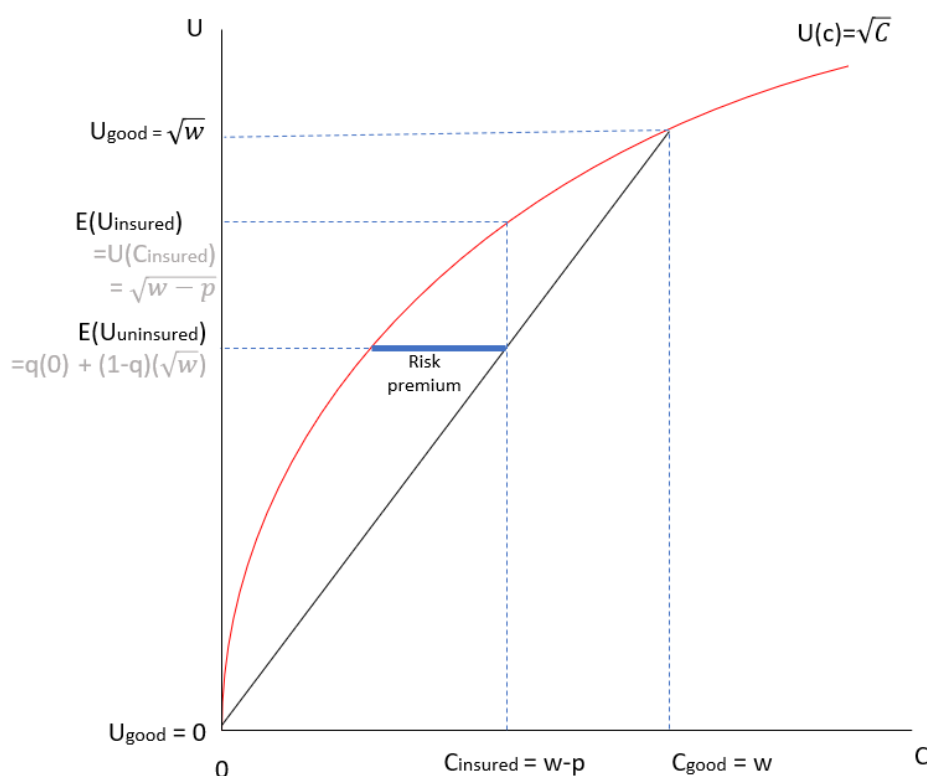
$$EU = (1 - q)\sqrt{w} + q\sqrt{0} = (1 - q)\sqrt{w}$$

(b) How much insurance at an actuarially fair price would individuals buy (No need for calculation)

Given the utility function $U(C) = \sqrt{C}$, individuals are risk averse. We therefore know that at an actuarially fair price they would purchase full insurance such that their consumption is equal in each state of the world.

(To solve formally, you would want to show that the individual maximizes EU by setting benefits b equal to the good state consumption w . That is, solve $\max_b EU = q\sqrt{b - p} + (1 - q)\sqrt{w - p}$ s.t. $p = qb$. Using substitution we can plug in $p = qb$, and solve $\max_b EU = q\sqrt{b - qb} + (1 - q)\sqrt{w - qb}$, with FOC $\frac{\partial EU}{\partial b} = 0$, which solving for b simplifies to $b = w$.)

(c) Present the previous result graphically, making sure to label (1) the axes, (2) the high and low consumption outcomes, (3) $EU^{insured}$, (4) $EU^{uninsured}$, and (5) the risk premium.



(d) When individuals have their own, unobservable to private insurers and to the government, probability of being unemployed q_i , the government might need to intervene in the insurance market. Explain why.

This is due to adverse selection. When individuals looking for insurance have private information that is not observable to the insurer, in this case their own probability of being unemployed, the private insurance market can unravel such that none (but the highest risk individual) is insured, even though everyone would want to purchase insurance. When this is the case government mandating everyone to buy insurance can be pareto improving.

Let's now assume that the government intervenes and provides unemployment insurance benefits b to the unemployed. This is financed by a payroll tax t paid by the employed.

(e) Write down the government's constraint for a balanced budget and individuals expected utility as a function of q , w and b .

Budget Constraint:

$$qb = (1 - q)t$$

$$t = \frac{q}{1 - q} * b$$

Expected utility:

$$EU = (1 - q)\sqrt{w - \frac{q}{1 - q} \cdot b} + q\sqrt{b}$$

Some students asked if you could treat t as a rate applied to the wage w , rather than an amount. If you did that, the answer would be:

$$qb = (1 - q)tw$$

$$EU = (1 - q)\sqrt{w - \frac{q}{1 - q} \cdot \frac{b}{w}} + q\sqrt{b}$$

(f) When the likelihood of being unemployed depends positively on the generosity of UI benefits b , should the government provide full or partial insurance? Explain.

This is a case of moral hazard: the probability of being unemployed is a function of the generosity of the benefits. Under moral hazard the government should only provide partial insurance.

Arkansas, California, and New York are considering reforms of their unemployment insurance programs and have invited you to give your expert opinion on the optimal policy. They have estimated two parameters that they think will be useful in guiding your advice: The change in consumption while unemployed for a \$1 increase in the UI benefit rate ($\frac{\partial c}{\partial b}$) and the elasticity of unemployment durations with respect to the benefit rate ($\varepsilon_{dur,b}$). The estimates are as follows:

	Arkansas	California	New York
$\frac{\partial c}{\partial b}$	0.2	0.3	0.3
$\varepsilon_{dur,b}$	0.8	0.8	0.5

(g) Explain why $\frac{\partial c}{\partial b}$ is relevant in determining the optimal UI benefit rate. Based on this parameter only, which state(s) would you recommend adopt higher UI benefits?

The change in consumption when unemployed for a \$1 increase in the UI benefit rate tells us about the need for income during unemployment. A low number implies a low need for consumption smoothing while a large one implies a large need for consumption smoothing. Therefore based only on this parameter California and New York should have higher UI benefits than Arkansas.

(h) Explain why $\varepsilon_{dur,b}$ is relevant in determining the optimal UI benefit rate. Based on this parameter only, which state(s) would you recommend adopt higher UI benefits?

The elasticity of unemployment durations with respect to the benefit rate is a way to measure moral hazard. A small number implied that increasing UI benefits does not impact the probability of unemployment, while a large number implies that increasing UI benefits has a large impact on the probability of unemployment. Based only on this parameter New York should have higher UI benefits than Arkansas and California.

(i) Assuming the states are identical in all other dimensions, which state would you recommend should have the highest UI benefit rate? Which should have the lowest?

Optimal insurance balances the benefits of consumption smoothing with the moral hazard costs of longer unemployment durations. The consumption smoothing benefits are highest in California and New York and the moral hazard costs are highest in Arkansas and California. Thus, New York should have the highest insurance benefit rate, then California, and then Arkansas.

(j) How would you expect the parameters $\frac{\partial c}{\partial b}$ and $\varepsilon_{dur,b}$ to change during a recession? What does this imply for the optimal benefit level?

In times of recession it is likely that the value of consumption smoothing increases and $\frac{\partial c}{\partial b}$ goes up. This is because income substitution methods are reduced. For example, in a recession it might be harder for the partner of the unemployed to work more or for family and friends to provide assistance.

It is also likely that $\varepsilon_{dur,b}$ falls during a recession, since even workers who look hard for a job can't find one due to the few jobs available (left-wing view of rationed jobs in recession). There is a view that increasing UI benefits, increases the bargaining power of job seekers, leading to an increase in wages and therefore further reducing labor demand (right-wing view). This would imply $\varepsilon_{dur,b}$ increases during recession.

Overall it seems that increasing benefit amounts would be a reasonable policy (but there is a debate and the correct answer depends on what you stated above).

(k) In the context of unemployment insurance, explain what experience rating is. Provide an argument for perfect experience rating.

Experience rating is the linkage of the number of layoffs of a firm to the taxes it pays to contribute to the UI pool. In the US there is partial experience rating, meaning firms pay some of the additional cost they impose from laying off workers. However this allows firms to game the system, by temporarily laying off workers, who obtain partially subsidized vacation from the state, and rehiring them again. If this is an important concern perfect insurance rating might be desirable: firms would pay in taxes exactly the cost they impose on the UI system