

Homework 7 Hint and Q&A

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1 Hint Regarding Question 1

I received many questions regarding Q1. One hint in this question is to find the random variable that defines the duration of unemployment. Try to solve this question as following steps,

Define D as the duration of unemployment. What's the probability of $D = 1$? It's λ . That is the agent will stay unemployment for only one period and go to work at time 2 with probability λ .

What about $D = 2$? What's the probability that agent will stay unemployed for two periods and go to work at time 3? It's $(1 - \lambda)\lambda$.

What about $D = 3$?, same logic it's $(1 - \lambda)^2\lambda$

What about $D = j$?, same logic it's $(1 - \lambda)^{j-1}\lambda$.

Therefore, we defined the random variable D as following

$$D = j \in \{1, 2, 3, \dots\} \text{ with probability } (1 - \lambda)^{j-1} \lambda$$

Now the question is to find expectation of D , that is to show $\mathbb{E}(D) = \frac{1}{\lambda}$?

2 Regarding Question 2 and 3

Question: What does (c) ask us to do?

Answer: In part (b), you should find an implicit function that can solve w^* . This question (c) asks you to find $\frac{\partial w^*}{\partial \tau}$ in Q2 and $\frac{\partial w^*}{\partial \pi}$ in Q3. Unfortunately, you need to use implicit function theorem to derive them.

Question: Do we need to solve the integral?

Answer: no, you just need to express an implicit expression that relating w^* to (b, β, τ) , NOT $W(w)$ and U .

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