Labor Economics Field Exam

June 2025

Instructions

This is a closed book examination. No written materials are allowed.

You have 1 hour to complete the exam. It is worth 100 points.

Consider two individuals W and M living for T periods with utility function $U(c,l) = U(c, T-h)$, where c is consumption, l is leisure, T is total time available, and h is hours of work. The utility function takes the following form:

$$U^i(c_i, T-h_i) = \frac{c_i^{1+\rho_i}}{1+\rho_i} - \kappa_i \frac{h_i^{1+\sigma_i}}{1+\sigma_i}, \quad i = W, M,$$

with $\rho_i \leq 0$ and $\sigma_i \geq 0$. Individual i is endowed with non-labor income $Y_i(t)$, receives a wage $w_i(t)$ if working, and can save using a risk-free asset with gross return $R(t)$. There is no uncertainty. The following questions are related to the labor supply functions and elasticities we studied in class.

1. (10 points) Initially W and M are singles and make independent decisions. Write down their intertemporal problem.

2. (10 points) Derive their Frish labor supply functions.

3. (10 points) Derive the corresponding Frish elasticities.

   W and M decide to get married and are married in all the remaining questions. After marriage they have the same utility functions as before marriage:

$$U^i(c_i, T-h_i) = \frac{c_i^{1+\rho_i}}{1+\rho_i} - \kappa_i \frac{h_i^{1+\sigma_i}}{1+\sigma_i}, \quad i = W, M.$$

4. (10 points) Write down their joint intertemporal problem under the assumption that they make efficient decisions (they cooperate) and that they will stay married until T (you don't have to consider divorce). (Hint: if they make efficient decisions, their problem is equivalent to a Pareto or social planner problem; or follow what we did in class for the cooperative model of the household and add dynamics).

5. (10 points) Derive their Frish labor supply functions and the corresponding Frish elasticities.

6. (10 points) What are the differences between the Frish labor supply functions of W and M as single and as married? Provide an intuition for your result.

7. (10 points) W is promoted and receives a wage increase. Determine the effect of W's wage increase on M's labor supply by using the M's Frish labor supply function you derived earlier. Provide the economic intuition behind your answer to this question.

8. (10 points) What data do you need to estimate W's and M's Frish labor supply functions and the corresponding elasticities?

9. (10 points) The government asks you to estimate the Frish labor supply functions you derived earlier. What are the main econometric issues you need to address to estimate them?

10. (10 points) You estimated W's and M's Frish elasticities and you found that they are 0.2 and 0.1, respectively. What can you conclude about W's and M's Marshallian and Hicksian elasticities? Explain.