

**Econ 431-01: Public Finance**  
**Prof. Sarah West**  
**Homework 4**  
**50 points**

1. (8 points) *Labor/Unpaid time choice problem:*

Patrice has the following utility function, where  $Y$  is income and  $L$  is unpaid time:

$$U = 1/5 \ln Y + 4/5 \ln L$$

If she works, she can earn \$12.00 per hour. You may assume that Patrice has 120 hours per week of time.

- a. Solve Patrice's labor/unpaid time problem. How many hours will Patrice work? What will her income be? How many hours will she spend doing unpaid activities?
- b. Write the general function, based on the utility function above, for labor in terms of income and the wage (replace \$12.00 with  $w$ , 120 hours with  $T$ , and the dollar amount of income with  $Y$ ).
- c. Using the Slutsky equation as a guide, and using the equation you wrote down in part (b), derive the equations for income and substitution effects that correspond with this particular utility function.
- d. Now, plug in numbers for wage, income, and perhaps time into your income and substitution effect equations. Which effect dominates?

2. (9 points) *Welfare Reform:*

- a. Under what conditions would welfare reform (the change from AFDC to TANF) increase the number of hours worked by low-wage individuals? Are these conditions likely to hold?
- b. Write down and carefully explain each variable in the equation estimated by Goodman-Bacon. Why does he use "first-differences"? What role do state-month fixed effects play? What coefficient or estimate do we use to determine the effect of reform during boom? During recession?
- d. According to Goodman-Bacon, how did welfare reform affect caseloads? Do his results differ from those found previously in the literature (especially by Wallace and Blank)? Explain.
- e. Based upon Goodman-Bacon's results, if a U.S. state wants to minimize welfare caseloads, what kinds of TANF policies should it implement and how stringent should these policies be? Explain, making sure you refer to specific econometric results in your answer.

3. (9 points) Bitler and Hoynes

In his comments on the paper by Bitler and Hoynes (found at the end of the paper), Bruce Meyer highlights three main sets of findings. For each of the findings described in quotes below, state in which table or tables the results are shown, and the coefficient or coefficients (or other numerical results) that are the most closely related to the statement. Then, explain how Meyer drew the conclusions he did from the numerical results you present.

a. “Among the most important findings from this analysis are that even though unemployment rose more in the recent recession than in the 1979–82 recession, official poverty rose less, and total consumption and food consumption in the bottom income quintile actually went up. Also, food stamp receipt rose much more in this recession than in past ones. These initial results do not indicate a newly permeable safety net” (p. 138).

b. “The paper argues that food stamp caseloads and receipt have become more sensitive to unemployment, but that the sensitivity of AFDC/TANF to unemployment has not risen or may have fallen over time. However, the evidence seems to be mixed” (p. 138).

c. “The paper’s third set of results examines the effects of welfare reform on various well-being measures, principally poverty rates...The paper regresses several poverty measures, family structure, and a dummy variable for neither work nor welfare receipt on the unemployment rate after welfare reform as well as the unemployment rate for the entire period. These results are probably the most important findings of the paper. For only one of the outcomes is the key interaction coefficient significantly different from zero. That outcome is the share of people with income below 150 percent of the official poverty line. For the other cutoffs (100 percent and 50 percent of the poverty line), the coefficients are insignificant” (p. 140 and 141).

4. (9 points) *Partial equilibrium tax incidence*

Suppose that the demand for beer can be represented as:  $P = 400 - 2Q$  and that the supply of beer can be represented by  $P = 2Q$ .

- Now suppose a unit tax equal to  $T$  is assessed on beer consumers. How much beer will be purchased? What price will consumers pay? What price will producers get?
- Derive the equations that can be used to solve for the incidence of the tax on consumers and on producers. Who bears what proportion of the tax? Does this make sense given the relative elasticities of demand and supply?
- Under what different conditions would the incidence of the tax be borne completely by consumers? By producers? Provide graphs in your explanation.
- Assuming there are no externalities from the consumption of beer (crazy assumption), solve for the equation for the deadweight loss of the tax, and interpret it in words.

5. (9 points) *Tax Incidence*

- Generally speaking, how does using annual income affect incidence estimates, compared to using annual consumption?
- How does including households that do not consume the taxed good affect incidence estimates? Use the tables from West (2004) as an example in your answer, but be sure that your answer generalizes beyond West (2004).
- How does allowing for behavioral responses to differ across income groups affect incidence estimates? Use the tables from West (2004) as an example in your answer, but be sure that your answer generalizes beyond West (2004).

6. (6 points) Why is the incidence of tax credits for the Toyota Prius “surprising”?