

**Econ 230B**  
**Spring 2022**  
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**Problem Set 2**

**DUE DATE: April 4**

**1. Chasing Natural Experiments within a Country**

As seen in class, many of the best papers on migration responses to taxes and transfers exploit a policy change (a so-called “Natural Experiment”) in order to obtain convincing estimates. This exercise asks you to find a Natural Experiment and propose an estimation methodology.

Download the pdf copy of the EU Tax Observatory report on “New Forms of Tax Competition in the European Union” ([link here](#)). Chapter 3 of this publication describes preferential individual income tax schemes for new high income migrants.

a) Find the introduction of one such scheme in one country that could be used to estimate migration responses to taxes for some group of interest in the population. Make sure the scheme is large enough to be useable for compelling identification. Describe the scheme you have picked.

b) Look for the papers cited in the EU tax observatory report and on google scholar to check whether the scheme you have picked has already been analyzed. Ideally, you want to be the first one to analyze this scheme. If there are already existing papers studying this scheme, explain why your proposed analysis would complement or add to the existing research on your chosen scheme.

c) Describe the methodology you would use to estimate such migration responses. In particular, make sure to be fully explicit about the assumptions you need to identify the migration responses.

d) Describe the data you would need to carry out the analysis. Survey or administrative data, variables, realistic sample size, time period, panel or repeated cross section, etc. Search online to investigate whether such data exist and how they could be obtained for the research analysis you are proposing. In particular, discuss whether you would need to follow the same people as they move across countries or whether data from a single country would be sufficient for your analysis.

## 2. Bunching at kink points

a) Consider a utility function based on consumption  $c$  and hours of work  $h$  of the form:

$$u(c, h) = c - \frac{h^{1+k}}{1+k}$$

Individuals have a pre-tax wage rate  $w$ , supply hours of work  $h$ , and earn  $z = w \cdot h$ .

The tax schedule depends on earnings  $z = w \cdot h$  and takes the following form:

$$T(z) = 0 \text{ if } z \leq \bar{z}$$

$$T(z) = \tau \cdot (z - \bar{z}) \text{ if } z > \bar{z},$$

where  $\tau$  is the constant marginal tax rate in the top bracket. Draw the budget set for a given individual and solve for the optimal  $(c^*, z^*)$  choice as a function of  $w$ . Make sure to distinguish cases where the individual is on the first bracket, bunches at the kink, or is on the second bracket.

b) Derive the compensated elasticity of hours of work with respect to net of tax wages for this utility function.

Suppose that wages are distributed according to a density function  $f(w)$  (with population normalized to one). Give a formula for the fraction of individuals bunching at the kink point.

c) I have created a data-set of 5,000 observations of earnings outcomes for a such a population of individuals assuming that  $\tau = 0.3$ , and that  $w$  is distributed according to some distribution  $f(w)$ . I have then graphed a histogram of earnings by \$250 bands (\$0-\$249, \$250-\$499, \$500-\$749, ..., \$19,750-\$19,999). What is  $\bar{z}$  and why?

d) Using the histogram from c) and your answers to a) and b), try to give an estimate of the compensated elasticity of hours of work with respect to net of tax wages. You do not need to provide standard errors, just a point estimate.

