

UNIVERSITY OF ILLINOIS
Department of Economics

Economics 471: Econometric Analysis

Midterm Review Question

1. A number of econometric studies have set out to answer the question: "Do different income sources have different marginal propensities to consume?" Below we present some (stylized) empirical results along these lines based on cross-section data on households. Denote

$$\begin{aligned} C &= \text{annual consumption expenditure} \\ x_h &= \text{earned income of household head} \\ x_s &= \text{earned income of spouse} \\ x_w &= \text{transfer income (welfare)} \\ x_p &= \text{property income} \\ x_e &= x_h + x_s \\ x_t &= x_e + x_p \end{aligned}$$

Consider the following regression results.

$$(1.) \quad C = .90x_h + .85x_s + .95x_w + .75x_p ; \quad S_1 = 500$$

(.02) (.03) (.04) (.06)

$$(2.) \quad C = .98x_w + .88x_e + .74x_p ; \quad S_2 = 510$$

(.03) (.05) (.08)

$$(3.) \quad C - x_w = .88x_e + .74x_p ; \quad S_3 = 530$$

(.04) (.05)

$$(4.) \quad C - x_w = .90x_t ; \quad S_4 = 620$$

(.12)

The sample size is $n = 104$ for each model, standard errors are reported below the estimates and $S_j = \sum \hat{u}_i^2$ for the j^{th} equation. Formulate and test the following hypotheses.

Treat the hypotheses and tests as independent (even though this is obviously formally incorrect). In each case, present a test statistic and critical value as well as a conclusion drawn from the test. Use $\alpha = .05$ throughout. Treat the model represented in equation (1.) as the alternative hypothesis in each case.

- a.) The mpc on x_h and x_s are equal.
- b.) The mpc on x_w is one.
- c.) The mpc on x_w is one *and* (a.) is true.
- d.) The mpc on x_w is one *and* the mpc's on x_h , x_s and x_p are equal.

Note on terminology: Marginal propensity to consume is abbreviated mpc. Each of the estimated coefficients is a mpc in the sense that it purports to estimate the proportion of an increment of a given type of income that is spent on consumption.