

Exercise 6 - Simultaneity (mostly identification and reduced forms)

QuantII

Due: March 5, 2008

- 1a. Consider the 2 equation model (for person i , is omitted, and the notation is scalar):

$$y_1 = by_2 + cx + dz + e_1 \quad (1)$$

$$y_2 = gy_1 + hx + pz + e_2 \quad (2)$$

where the errors, e_1 and e_2 , have some arbitrary structure.

What is the reduced form of this system?

- b. Use high school algebra to see how the structural parameters are related to the reduced form parameters and see if the structural model is identified.

c. Repeat but assume d and h are zero.

d. Repeat but assume that d and p are zero.

e. Now consider

$$y_1 = by_2 + cx + e_1 \quad (3)$$

$$y_2 = gy_1 + pz + rw + e_2 \quad (4)$$

What is the reduced form of this structure?

- f. Relate the structural and reduced form parameters and discuss what that implies for estimation.