

Example Assignment 2 Simultaneous Equations Model

Demand and Supply Equations

$$\ln S_t = \beta_{10} + \beta_{11} \ln P_{Dt} + \beta_{12} \ln P_{X2t} + \beta_{13} \ln P_{X3t} + \beta_{14} \ln P_{X4t} + \varepsilon_{1t} \quad (1)$$

$$\ln D_t = \beta_{20} + \beta_{21} \ln P_{Dt} + \beta_{22} \ln GDP_t + \varepsilon_{2t} \quad (2)$$

where: S_t = Domestic Supply at time t
 D_t = Domestic Demand at time t
 P_{Dt} = Domestic Price at time $t = P_{Mt} + T_t$
 P_{Mt} = Import Price at time t
 T_t = Tariff at time t
 P_{X2t} = Price of Input 2 at time t
 P_{X3t} = Price of Input 3 at time t
 P_{X4t} = Price of Input 4 at time t
 GDP_t = Gross Domestic Product at time t

Endogenous variables in this system include S_t , D_t , and P_{Dt}

Exogenous variables in this system include P_{X2t} , P_{X3t} , P_{X4t} , and GDP_t

1. State reduce form model of these system models.
2. Estimate reduce form model using OLS and prediction of the endogenous variables.
3. Estimate structural form using predicted endogenous variables as independent variables in the structural form model.
4. Estimate the structural models of these system equations using OLS, 2SLS, 3SLS, and I3SLS. Concerning on the asymptotic property, which model is the most appropriated model? Why?
5. What does β_{11} and β_{21} mean?