

## 1 Simultaneous equation models

1. What is the difference between the structural and reduced form? How we interpret the parameters in structural and reduced form?
2. What is the necessary identification condition for an equation in a structural model? Discuss the problem of identification in the context of the simple 2 equation model of demand and supply.
3. Explain with an example what is Haavelmo (endogeneity) bias and how it influences the properties of the OLS estimator.
4. Compare indirect OLS and 2SLS and explain why the second method of estimation is better suited for estimation of the parameters in simultaneous equation models.
5. Explain what is the difference between limited information and full information methods of estimation using as an example 2SLS and 3SLS estimators.
6. Explain what is the Lucas critique of the classical econometric models and how the model can be made robust to it.

## 2 Testing methodology

1. Explain using an example what is Lavell bias and how we can avoid it.
2. Describe the general to specific testing methodology and explain why it is better than specific to general methodology
3. Describe using an example how do we use the information criteria in order to choose the proper form of the model

## 3 Univariate time series models

1. What is the difference between the short run (impact) and long run multipliers. Explain how do we calculate them in  $ARMA(p, q)$  model.
2. Give the necessary conditions for the stability of an  $ARMA(p, q)$  process.
3. Explain what is the Granger causality and how do we test for it.
4. Explain the difference between the stationary and nonstationary variables using as an example the white noise and random walk models.
5. Describe how we test for the order of integration using the Dickey-Fuller test and how this procedure have to be adjusted to take into account the autocorrelation of error term and the trend in the time series.
6. Explain what is the spurious regression problem.
7. Write down the univariate error correction model and give an interpretation to the parameters of it. Explain the connection between the error correction model and the cointegration.
8. Explain what is the cointegration and describe the process of testing for with Engle-Granger procedure.

## 4 Vector autoregressive models

1. Explain how we interpret the impulse response function and why their shape can depend on the way we identify the shocks.
2. Explain what are the assumption under which the Sims (Choleski) ortogonalization of shocks is justified.
3. Explain how the forecast are formed with the use of  $VAR$  model. What is the forecast variance error decomposition?
4. Describe the process of testing for cointegration in a  $VAR$  model with the Johansen test
5. Explain why the identification is needed if we want to interpret the cointgration vectors in a  $VAR$  model with more than one cointegration relation. What is the necessary condition for identification in this case?
6. Explain what kind of restrictions can be used to identify the Structural  $VAR$  model.

## 5 Generalized Method of Moments

1. Explain what are the ways on which  $GMM$  generalize the classical method of moments
2. Explain how the moment restrictions are used for estimation of parameters in the case of exactly identified model.
3. Explain what are the conditional moment restrictions and how they can be replaced with unconditional moment restrictions - give an example of conditional moment restrictions based on economic theory.
4. Explain what is the necessary condition for identification in  $GMM$  and the process of estimation if model is overidentified.

## 6 Calibration

1. Explain what we mean by calibration and what is the difference between calibration and estimation. How the parameters of the calibrated model are determined?
2. Why in some cases calibration is the only practical method of determining the parameters of the model?
3. Explain what are the applications of calibrated models
4. Explain what is the difference between the calibration in microeconomic and macroeconomic applications of this procedure.