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Exercise 2: State Space Models

Phase I: Imputation of missing data. Monthly GDP

a) Specify the state-space model:
   - State:
   - Observations:
   - Transition Equation for the state:
   - Observation Equation:
   - Model Parameters:

b) Which method has been used to obtain the maximum likelihood estimators? (Non-linear optimization/EM algorithm)

c) Estimated Model:

d) Final goal and interpretation/validation of the result

Phase II: Structural Time Series: Deseasonalisation of the affiliates Time series

a) Specify the state-space model:
   - State:
   - Observations:
   - Transition Equation for the state:
   - Observation Equation:
   - Model Parameters:

b) Which method has been used to obtain the maximum likelihood estimators? (Non-linear optimization/EM algorithm)

c) Estimated Model:

d) Final goal and interpretation/validation of the result

Phase III: Multivariate Time Series. Monthly GDP by using the affiliates time series

a) Specify the state-space model:
   - State:
   - Observations:
   - Transition Equation for the state:
   - Observation Equation:
   - Model Parameters:

b) Which method has been used to obtain the maximum likelihood estimators? (Non-linear optimization/EM algorithm)

c) Estimated Model:

d) Final goal and interpretation/validation of the result