MONASH University

MONASH
BUSINESS
SCHOOL

Forecasting: principles and practice

Rob J Hyndman

3.2 Dynamic regression

#Regression with ARIMA errors

##Regression with ARIMA errors

Regression models

$$y_t = \beta_0 + \beta_1 x_{1,t} + \cdots + \beta_k x_{k,t} + e_t,$$

- y_t modeled as function of k explanatory variables $x_{1,t}, \ldots, x_{k,t}$.
- In regression, we assume that e_t was WN.
- Now we want to allow e_t to be autocorrelated.

Example: ARIMA(1,1,1) errors

$$y_t = \beta_0 + \beta_1 x_{1,t} + \cdots + \beta_k x_{k,t} + n_t,$$
$$(1 - \phi_1 B)(1 - B)n_t = (1 + \theta_1 B)e_t,$$

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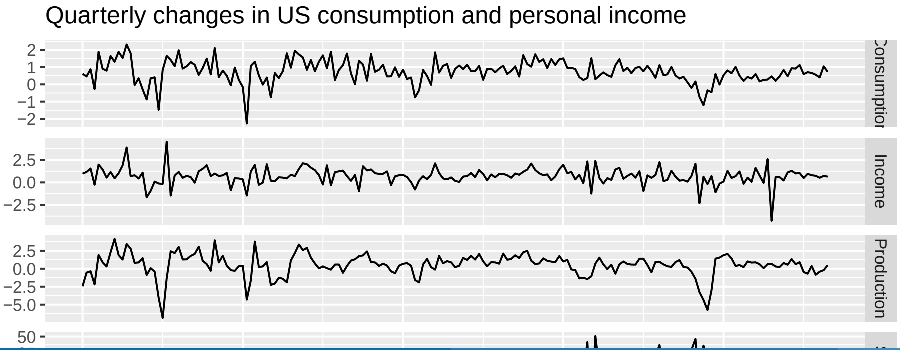
Selecting predictors

- AICc can be calculated for final model.
- Repeat procedure for all subsets of predictors to be considered, and select model with lowest AICc value.

##US personal consumption & income



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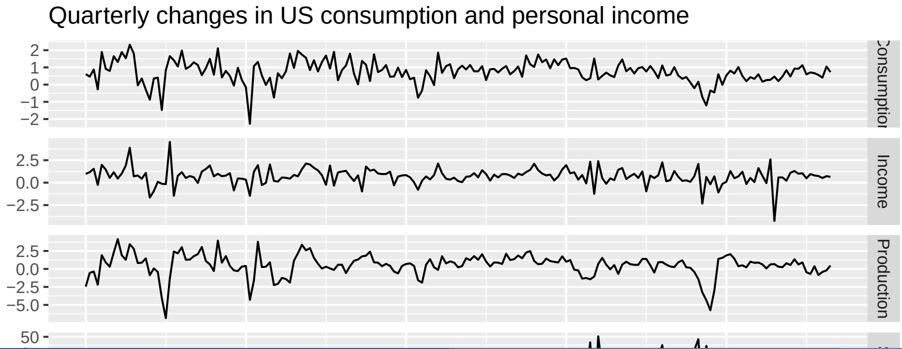

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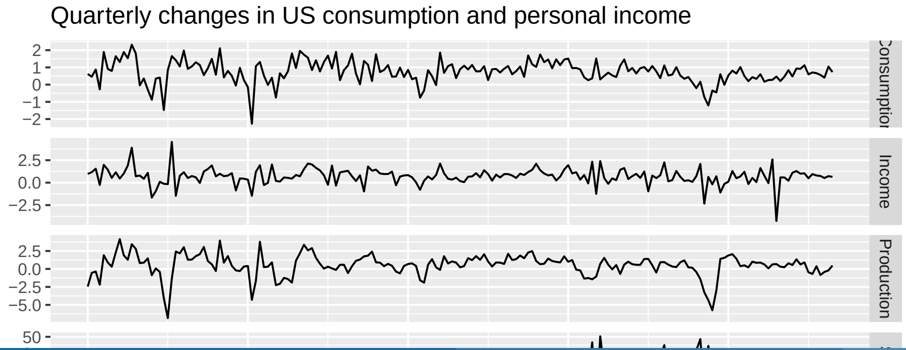

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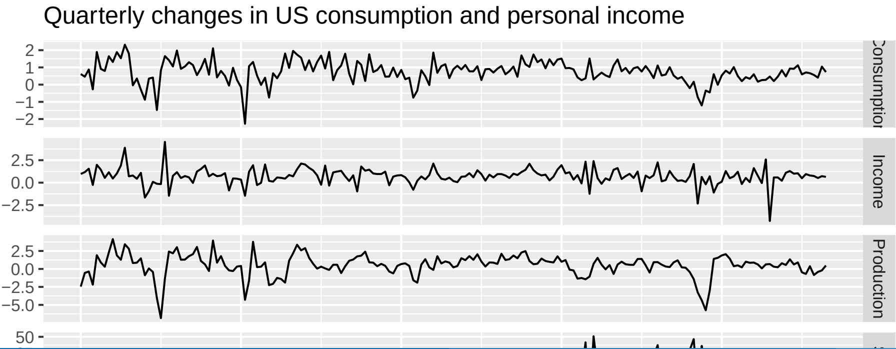

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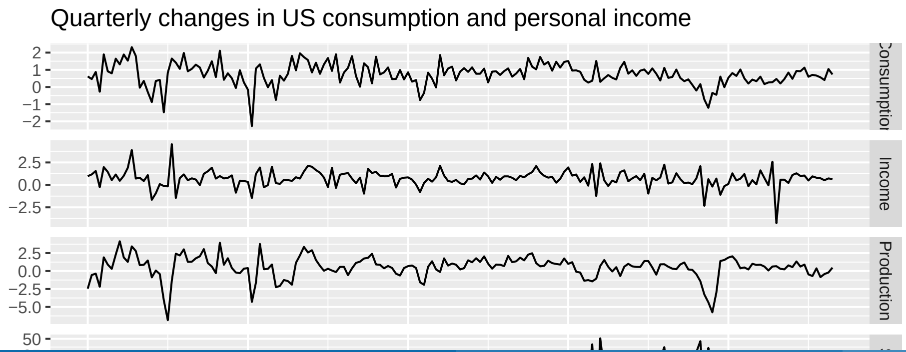

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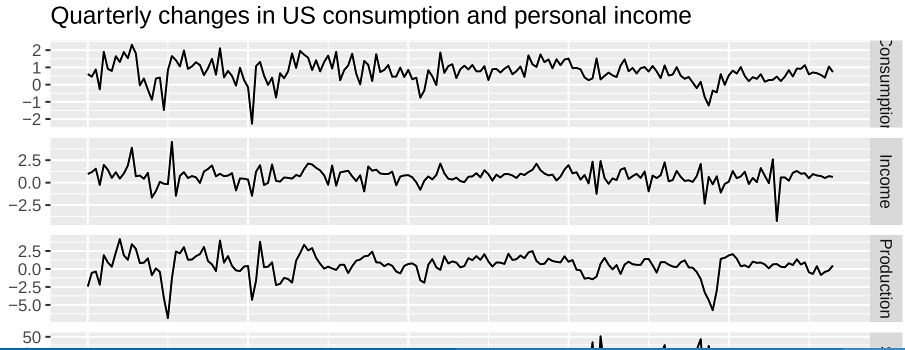

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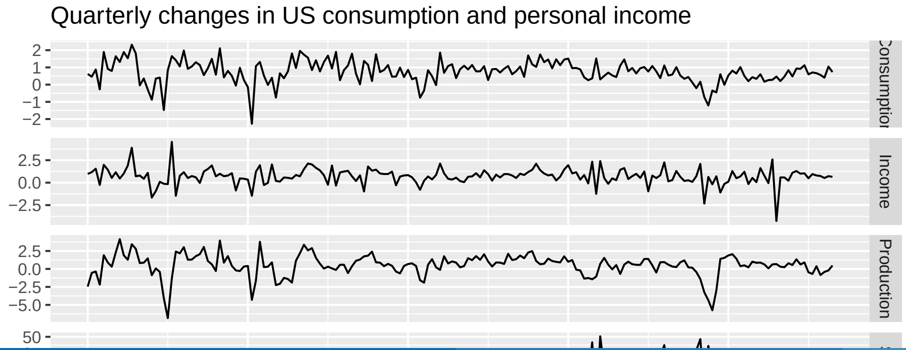

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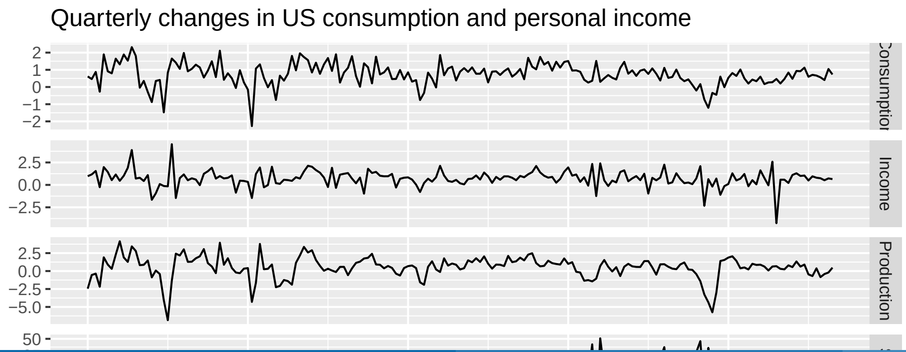

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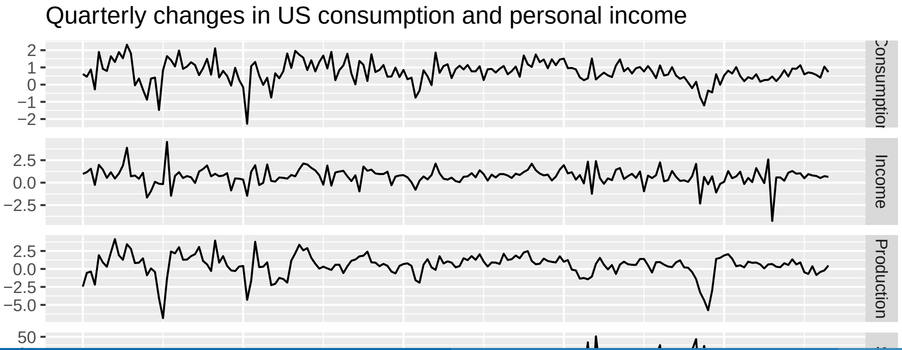

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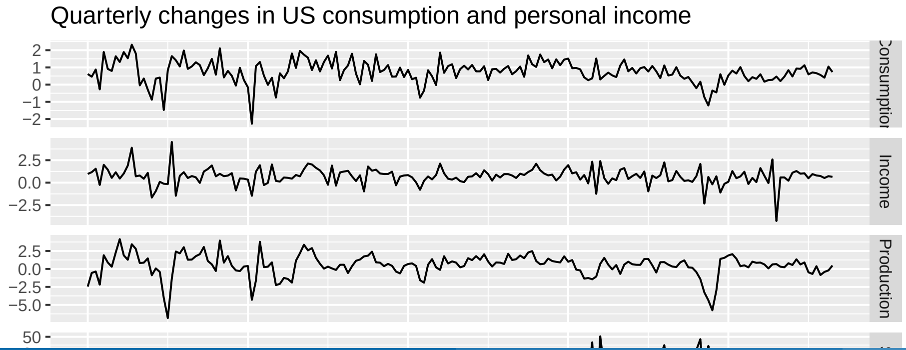

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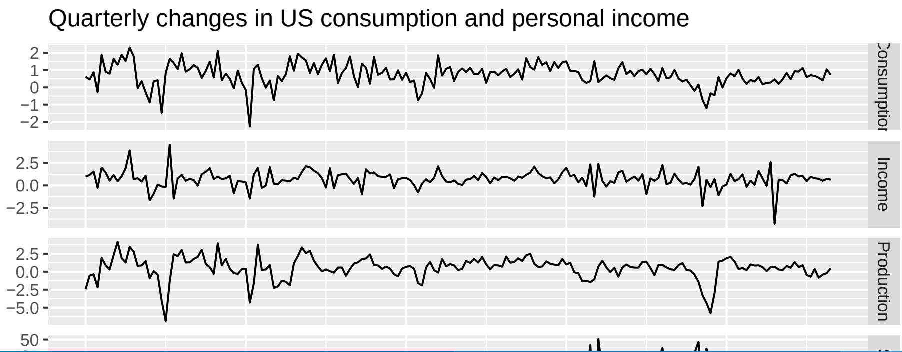

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