New registrations of cars
Case Study 1
The EViews-workfile cars.wf1 and the CSV-file cars.csv contain a monthly
Time series covering the period from January 1990 to October 2014 the number of passenger cars
New registrations in the euro area include (Source: https: //sdw.ecb.europa.eu / quickview.do? SERIES_KEY = 194.RTD.M.S0.W.I_NCARS.Q).
Tasks

1. Plot the course of this time series graphically, if necessary
meaningful transformations of it. Describe the essential characteristics
teristika of the data in own words.
2. Model 1 - Simple Linear Model: Model the time series using a linear trend
model ignoring seasonal effects and
interpret the results. Further plot the residuals
and judge them.
3. Model 2 - Polynomial Model: Model the time series using a
global polynomial model ignoring seasonal effects,
you successively use a square, cubic, etc. trend adding them as an explanatory
variable to the model. Which degree of polynomial appears
reasonable/best and why? Interpret the results. Continue to set the
Graph residuals and judge them.
4. Model 3 - Polynomial model with seasonal effects: Expand Model
2 with two monthly seasonal dummy variables. Judge and interpret
The results graphically and numerically. In which months will there be
especially many / few new cars registered? Anything else jumps out at you ?

5. Graph the residuals in Model 3 and interpret them.
What could be the economic reason for the atypical deviations
1992/93 and 2008/09?

6. Compare Model 1 to Model 3 using the model selection criteria
(p-values, R^2 , AIC, BIC / Black criterion).
7. Examine the autocorrelations of the residuals in Model 1 through Model 3
and compare these. How well do they each meet the requirement of
Uncorrelation (autocorrelogram of the residuals, Durbin-Watson statistic)?

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8. Make a prediction for each of the next models (model 1 to model 3) for
two years. How do the point predictions differ, how do the standard
errors differ?
9. Consider a multiplicative model by using log (registrations)
linear modeling. Note: AIC and BIC need to be compared with the
additive model

10. Make a prediction for the multiplicative model for the next two years. Note: You should still log the forecasts from log (registrations)
convert to registrations.