Project proposal STK-MAT2011-sp19

On a quarterly basis Statistics Norway asks a sample of companies in the oil and gas industry of the amount of investments they plan for the remaining part of the current year and for all of the following year.

Usually the numbers are to low compared to what is actually invested and a common way to improve the estimates can be described as follows. If $y_t, t = 1, \ldots, T$ are the amount of actual investments and $x_t, t = 1, \ldots, T$ those planned as reported the previous year in the survey

$$\hat{y}_t = \frac{y_{t-1}}{x_{t-1}} x_t$$

is the new estimate. Since the survey is carried out six times, there are altogether six such forecasts.

There are several aspects which can be studied.

1. There exists methods for comparing forecasts and evaluate if the differences between them are significant. Such comparisons can be done for the six forecasts mentioned.

2. Looking at the expression for the forecast it can also be written as

$$\hat{y}_t = \frac{\sum_{j=t-k}^{t-1} y_j x_j}{\sum_{j=t-k}^{t-1} x_j^2} x_t = \hat{\beta}_k x_t$$

with $k = 1$. With $k = t-1$ $\hat{\beta}_k$ is the ordinary least square estimate. Investigating whether there are values between 1 and k-1 which yield better estimates, is also a possibility.