

TS Module 12: Parameter estimation method of moments HW

(The attached PDF file has better formatting.)

Homework assignment: Method of moments

An ARMA(1,1) process has $r_1 = -0.25$ and $r_2 = -0.125$.

- A. What is method of moments estimate of ϕ , the autoregressive parameter?
- B. What is method of moments estimate of θ , the moving average parameter?

You can solve for ϕ easily. Solve for θ with a quadratic equation, and choose the root whose absolute value is less than or equal to one.

These are method of moments estimates. We don't know the actual values of ϕ and θ . The method of moments is not the best estimator. We use maximum likelihood estimation if we have statistical software that gives the estimates. The method of moments shows the logic of the time series parameters and the sample autocorrelation function. It uses only pencil and paper, so it is good for homework assignments and final exam problems.

The final exam derives the parameters of AR(1), AR(2), MA(1), and ARMA(1,1) models by the method of moments. The ARMA(1,1) model takes a few minutes to solve the quadratic equation; the other models are easier. Review this homework assignment and the practice problems as preparation for the final exam.