ECON 5760
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Problem Set 6

Problem 1. Consider the DM-stat as presented in Heer and Maussner (2009):

$$DM(n) = y'X[\sum_t x_t x_t' \hat{\epsilon}_t^2]^{-1} X'y \tag{1}$$

Where $\hat{\epsilon}_t = y_t - X_t \hat{a}$. Demonstrate what happens to $DM(n)$ when $\hat{h}^K(K_t, Z_t) \to h^K(K_t, Z_t)$. *Hint: What happens to y_t as $\hat{h}^K(K_t, Z_t) \to h^K(K_t, Z_t)$?*

Problem 2. Consider the benchmark model with shocks to output with $u(C_t) = \frac{C_t^{1-\eta}-1}{1-\eta}$ and $F(Z_t, K_t) = Z_t K_t^\alpha$ with the resource constraint $f(K_t) = C_t + K_{t+1}$ where $f(K_t) = F(Z_t, K_t) + (1-\delta)K_t$. Assume that $log(Z_t) = \rho log(Z_{t-1}) + \epsilon_t$ where ϵ_t is normally distributed with mean zero and variance σ^2.

a. For the parameter values values $\alpha = .27$, $\sigma = .0072$, $\rho = .90$, $\beta = .994$, $\eta = 1$, and $\delta = 1$, solve the model by implementing PEA. It is well known that the PEA can be unstable and so be sure to implement the moving bounds approach of Maliar and Maliar (2003). To solve the model, you should use $T = 1,000$ for the simulation length. Plot your approximate solution versus the known solution and calculate the maximum absolute deviation.