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a.) Initial value $\gamma = A$, $\delta = 0$, $\rho = -1$, $V = 1$

$\hat{\gamma} = 2.89 \times 10^{-19}$

$\hat{\delta} = 0.802$

$\hat{\rho} = -1.883$

$\hat{V} = 3.396$

$\hat{b} = \frac{1}{1-\rho} = 0.349$

F-test: H_0: $\delta = 0$, $\rho = 0$, $V = 0$

H_a: otherwise

p-value $= 0 < \alpha = 0.05$

H_0 is rejected at .05 level.

b.) From model (2), Initial value $\ln\gamma = A$, $\delta = 0$, $\rho = -1$, $V = 1$

$\hat{\gamma} = 44.648$

$\delta = 0.835$

$\rho = -0.808$

$V = 0.992$

$b = 0.553$

F-test: H_0: $\delta = 0$, $\rho = 0$, $V = 0$

H_a: otherwise

p-value $= 0 < \alpha = 0.05$

H_0 is rejected at .05 level.

c.) If we change the initial value, the estimation result would be changed. Since, we have non-linear f^n there will be more than one solution.

Changing initial value as γ from A to 55, the solution will be closest to the γ which is $\hat{\gamma} = 15.2048$

According to the model, if γ, K, L is not changed and the efficient is increase, $\frac{-V}{\rho}$ would be lower as it is from $\frac{3.39}{1.58} \rightarrow \frac{1.06}{38.85}$, as well as other parameter.

d.) For Iterative process, if we change the convergence value [$\hat{\theta}_t = \hat{\theta}_{t-1} - A_t$ convergence value]

it will impact the estimator parameter. High convergence = high error as in (i) the rss is higher, but in (ii) less convergence value would lead to less error and require more iteration time, but in this case, we limit the iteration to 100 which is less than (a) that have 359 iteration, so it is possible that Iteration process could not meet the "convergence value" which it's happended for this case.

e.) If we change the initial value the estimated result would be changed like it was in (c).
However, in this case, the estimated parameter don't significantly change.

$\hat{\gamma} = 40 \rightarrow \ln\hat{\gamma} = 3.994$

≈ 44

as well as other parameter, this occured because the closest solution for both initial value is the same point.

f.) For the iterative process, if we change the convergence value, it will impact the estimated parameters.
But, in this case, the parameter doesn't change much which may occur because the initial values are quite close to the solution that we can see from the iterative process that took only about 20 times comparing to (a) that took 300 times.

g.) For the sign, meaning, and overall test, both model are in different,
However, the individual test of model (1) the 4 parameter is insignificant.
so, we will choose the model (2), eventhough, we have lower R^2.