Economic Growth Theory:

Problem set 7:

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Scumpeterian growth

1. Consider a centralised version of a Schumpeterian model in which the equation for the quality index is

$$\dot{Q} = \Xi p(C, Q)Q$$

where $\Xi = q - 1 > 0$ is the "quality jump" after the introduction of a successful innovation with probability of success p, where

$$p = \frac{1}{q}\left(B - \frac{C}{\zeta AQ}\right)$$

where $B > 0$ and $\zeta > 0$ is the cost parameter associated to the introduction of innovations. The representative consumer has the intertemporal utility functional

$$\int_0^\infty \ln\left(C(t)\right)e^{-\rho t}dt$$

The output of the final good for this economy is $Y(t) = AQ(t)$:

(a) write the first order conditions for the planner's problem.

(b) discuss the existence of a balanced growth path, write the system in detrended variables and find the long run growth rate;