Problem Set 8

1. Consider the Ramsey-Cass-Koopmans model with technical progress. Infinitely lived households have preferences

$$\int_{t=0}^{\infty} e^{-\rho t} u(c(t)) \frac{N(t)}{N_0} dt,$$

where $u'(c) > 0$ and $u''(c) < 0$. Firms produce final goods with a constant return to scale technology

$$Y(t) = F\left(K(t), L(t)\right),$$

where effective labor is $L(t) = A(t)N(t)$. Technology and population grow at rates g and n respectively. There is no depreciation.

a) Derive and interpret the modified golden rule.

b) Caracterize the dynamics of consumption and capital accumulation.

c) From an initial steady state, describe the dynamic adjustment of the economy to a permanent and unanticipated reduction in the growth rate of technology g.