

Problem Set 10

1. Consider the neoclassical growth model with technical progress. Infinitely lived households have preferences

$$\sum_{t=0}^{\infty} \beta^t u(c_t) \frac{N_t}{N_0},$$

where

$$u(c) = \frac{1}{1 - 1/\sigma} c^{1-1/\sigma}.$$

Firms produce final goods with a constant return to scale technology

$$Y_t = F(K_t, L_t),$$

where effective labor is $L_t = A_t N_t$. Technology and population grow at rates g and n respectively. There is full depreciation.

- a) Derive and interpret the modified golden rule.
- b) Characterize 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 .