Eksamensæt 2

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Endogenous growth theory

Assume production functionof final goods sector is given by:

$$Y(t) = [(1 + \alpha_K)K(t)^\alpha][A(t)(1 - \alpha_L)L(t)]^{1-\alpha}$$

where $1 - \alpha_L$ and $1 - \alpha_K$ is proportion of labour and capital allocated for final production

Capital stock is given by:

$$\dot{K}(t) = sY(t)$$

Production functions of R&D sector is given by:

$$\dot{A}(t) = B[\alpha_K K(t)]^\beta [\alpha_L L(t)]^\gamma A(t)^\theta$$

where $B > 0$ showa efficiency of research, $\gamma \in (0, 1)$ is the output elasticity of labour allocated in R&D, and $\theta \leq 1$ is a parameter describing the elasticity of existing knowledge (A) for the prodcution of increases in the stock of knownledge.

Population growth is exogenous

$$\frac{\dot{L}(t)}{L(t)} = n \quad or \quad \dot{L}(t) = nL(t)$$

Derive an expression for the growth rate of capital $g_K(t)$ and growth rate of technology gA(t)