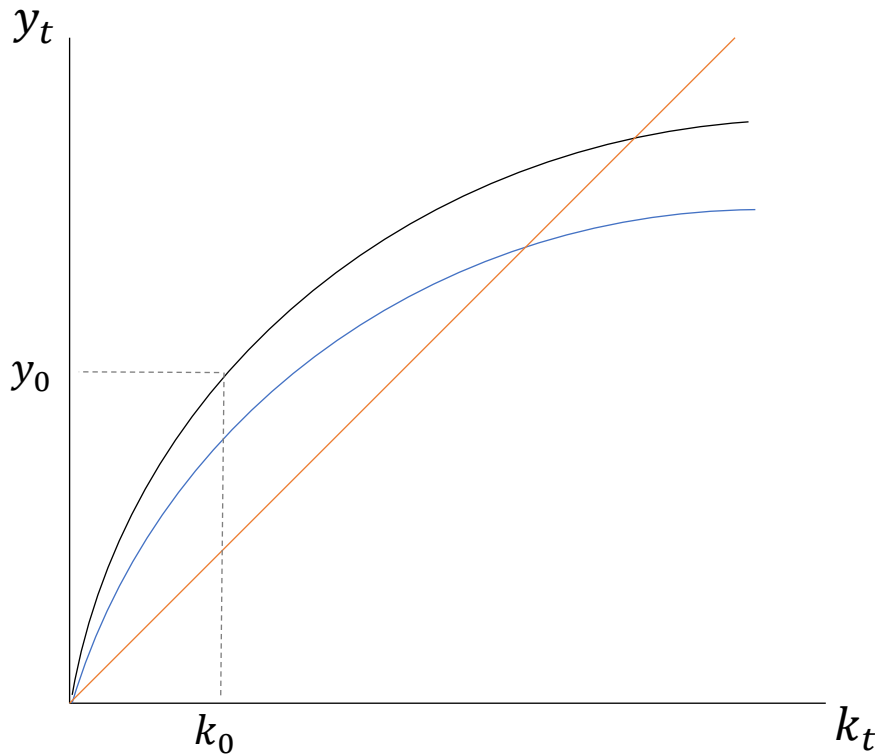


Exercise Session 2
Long Run Growth and Long Run Unemployment

TASK 1: Recall the Dynamics of the Basic Solow Model

- a) Use the graph below to graphically construct the equilibrium of an economy, assuming constant population and constant technology growth. Clearly indicate the curves and the resulting steady state in the graph.



- b) Use your initial equilibrium to illustrate the changes induced by a decrease in the savings rate.
 c) Further exercise for self-study: Repeat the graphical and verbal analysis for positive/negative changes in the depreciation rate.

TASK 2: Kaldor Facts and formal Derivation of the Results for w_t^* and r^* .

Assume a standard Cobb-Douglas production function: $Y = AF(K, L) = AK^\alpha L^{1-\alpha}$.

- a) Derive the first order conditions with respect to the input factors.
 b) Use your solutions to derive the labor and capital demand functions.

Now instead of using the basic Solow model assume the complete general Solow model, with time-varying total factor productivity:

$$Y_t = A_t F(K, L) = A_t K_t^\alpha L_t^{1-\alpha}.$$

- c) Derive the steady state values for w^* and r^* of the per worker variable and provide economic intuition.

Hint: Start from the capital accumulation equation given on slide 12 of the lecture slides.

- d) You will arrive at the result that in the general Solow growth model, w_t^* is growing with technology, while r^* is not. Provide economic intuition for this result.
- e) Is the Solow Model discussed in class able to capture the stylized Kaldor facts of long-term economic growth? Discuss this in context of the results of the model, i.e., e.g., the steady state values of the wage rate and the rate of return on capital.
- f) How is the rate of return on capital linked to the real natural interest rate?

TASK 3: Describe how an emerging economy could catch-up to advanced economies in context of the Solow Model. Why might it be easier for relatively open emerging economies to do so?

TASK 4: Briefly explain the concept of efficiency wages.