The study of new stimulates activity and professional growth. Therefore, I consider the use of system dynamics in the educational process to be realistic, useful and productive.

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SYSTEM DYNAMIC APPROACH
FOR ECONOMIC GROWTH INVESTIGATION

The models of economic growth investigate the mechanisms of influence that the rate of savings, the rate of growth labor resources and technological progress have on the standard of living of the population. Consider a simple model of economic growth that takes into account the behavior of households and firms. This model is described by a system of differential equations:

$$Y = F(K, AL) = K^{\alpha}(AL)^{1-\alpha} \quad 0 < \alpha < 1$$

$$L'(t) = nL(t)$$
$$A'(t) = gA(t)$$
$$K'(t) = sY(t) - \delta K(t)$$

The production function focuses on three factors: K – capital, L – labor and A – knowledge or technological progress. The stock of capital depreciates over time at a constant rate δ. The fraction output devoted to investment, s. Labor and knowledge grow at constant rates n and g. Where s, δ, n and g are exogenous parameters.

To study the dynamics of this model we use methods of system dynamics (Fig. 1). Increasing the savings rate due to various reasons (an increase in the propensity to survive under the influence of various psychological factors, or under the influence of methods of state regulation) from level s to level s_1 leads to a greater accumulation of capital and to higher level of output per person.
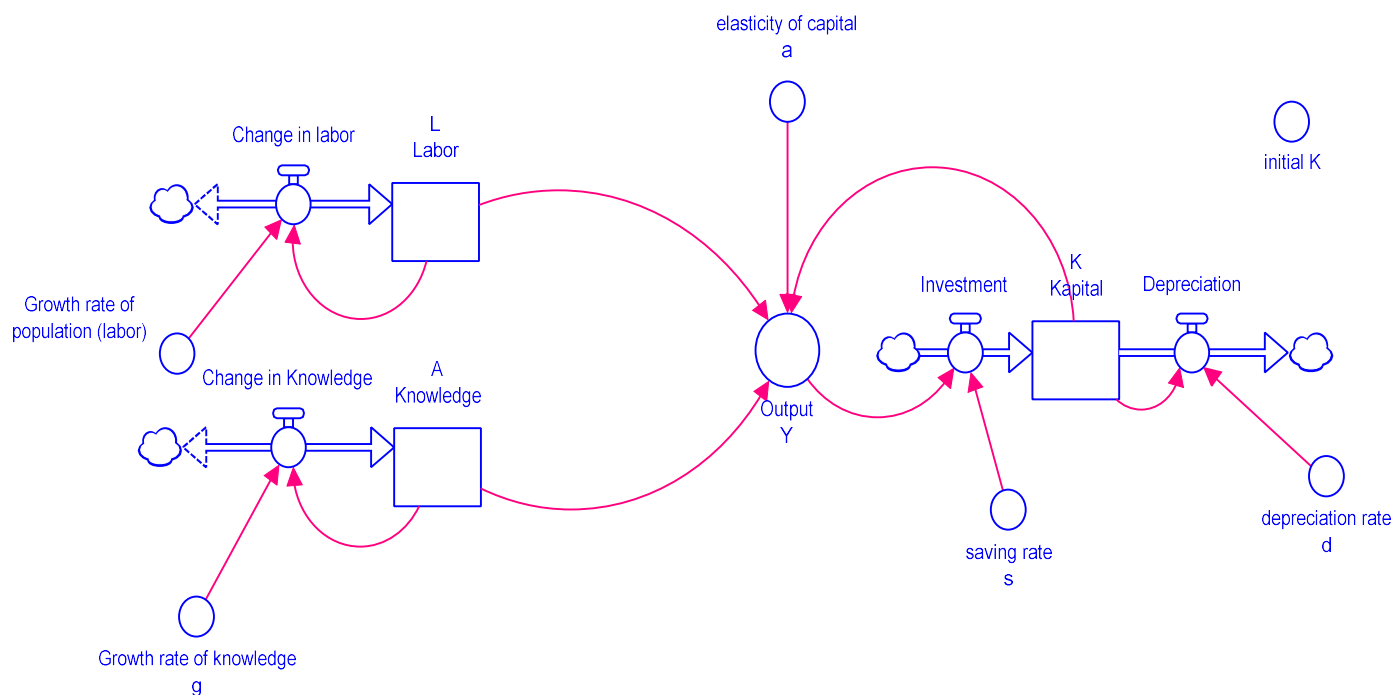

Figure 1. **Model of system dynamics for the analysis of economic growth**

Figure 2 (a) shows the dynamics of capital for different rates of savings s=0,2 and s=0,4. Figure 2 (b) shows the dynamics of output.

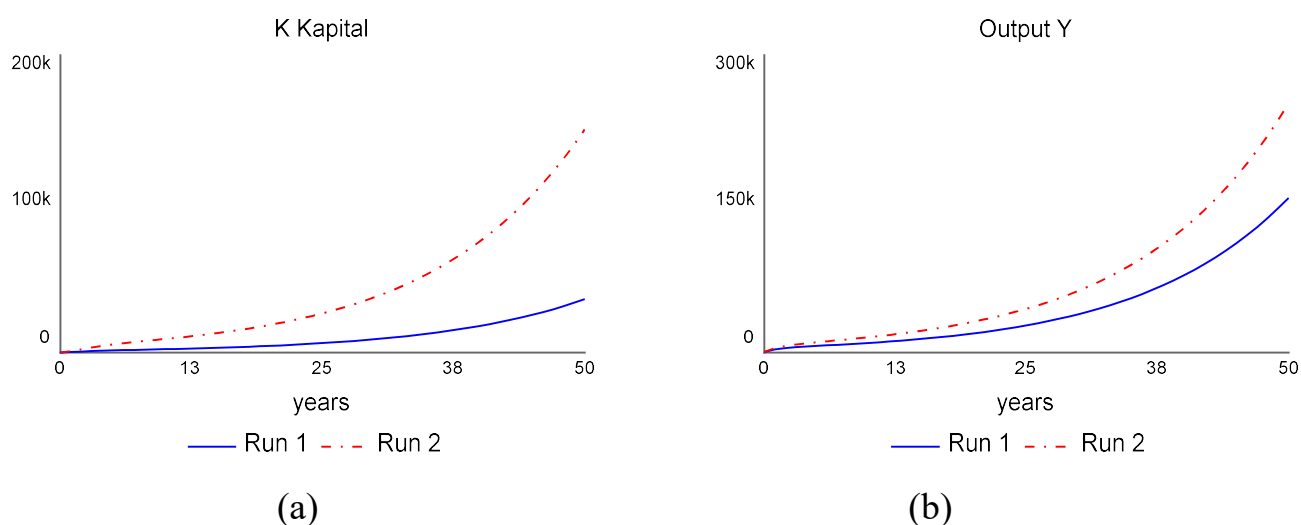(a)   (b)

Figure 2. **Dynamics of capital (a) and output (b) for different saving rates**

The constructed model makes it possible to research the dynamics of output at different rates of population growth. If it increases, then the level of investment and

output per person will decrease. And this is not surprising, since in the poorest countries of the world the pace of population growth is much faster than that of the developed ones.

The main factor that causes an increase in the standard of living of the population is technical progress. Figure 3 shows the output dynamics when g changes from 0,05 to 0,1.
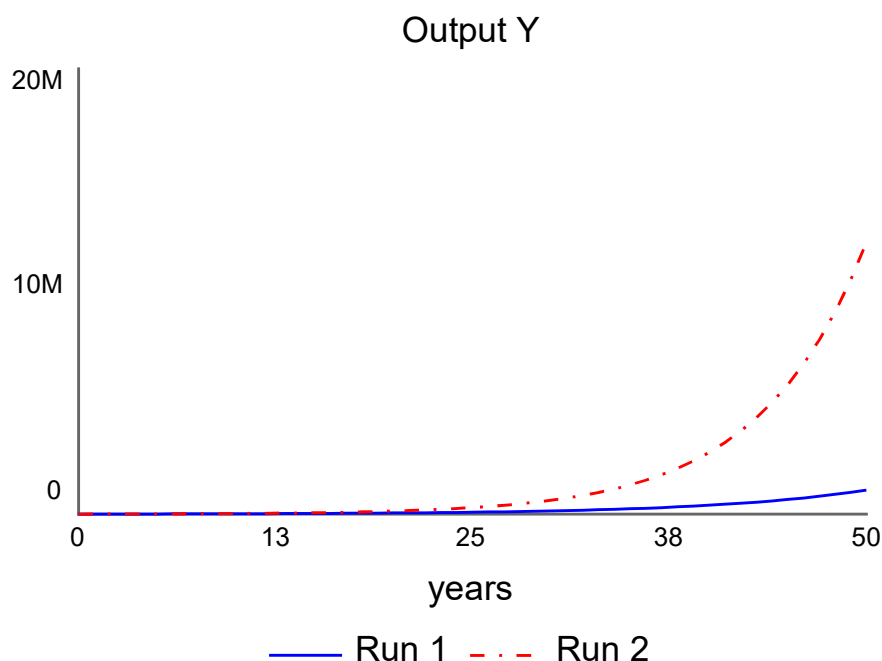

Figure 3. **The dynamics of output at different growth rates of technological progress**

The pace of technological progress provides and helps to support the continuous growth of production, and hence the growth of welfare, which is expressed in the growth of output and consumption per person.

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