The private commercial activity emerging in Ukraine requires systematization and generalization of the new economic reality and careful logical thinking about the processes of entrepreneurship and capital accumulation. One of the prevalent manifestations of entrepreneurship is speculative activity, which is conducted under conditions of decentralized control, without government regulation of the monetary system. This in itself is damaging to the economy [1].

In this paper we analyze the factors of private commercial activity, construct a capital-accumulation model, consider some numerical examples, and develop recommendations for improvement of the existing situation.

Capital accumulation through commercial activity is described by the system of equations

\[ S_{t+1} = \frac{U_{t+1}}{U_t}(1 - H_{t+1})(q_t S_t + K_t) - (I_t + \Pi_{t+1})K_t, \quad t = 0, 1, 2, \ldots, \]

where \( S_t \) are the funds accumulated in private commerce through credit transactions and buying and selling of goods; \( K_t \) is the credit to private commercial organizations (from the government or from commercial banks); \( U_t \) and \( U_{t+1} \) is the price of goods bought and sold, respectively; \( q_t \) is the accumulation rate, i.e., the proportion of funds in turnover. \( H_{t+1} \) is the rate at which sales revenue is taxed; \( \Pi_{t+1} \) is the interest rate on credit.

Equation (1) describes capital accumulation as a cyclic process that sums the revenue from buying and selling of goods net of taxes and interest expense. Let

\[ a_t = \frac{U_{t+1}}{U_t}(1 - H_{t+1})q_t, \]

\[ b_t = \left( \frac{a_t}{q_t} - 1 - \Pi_{t+1} \right)K_t, \]

Then Eq. (1) takes the form

\[ S_{t+1} = a_t S_t + b_t. \]

The value of \( a_t \) is influenced by the price "scissors," the tax rate, and the accumulation rate. A condition for increasing accumulation is

\[ a_t > 1. \]

Equation (4) is solved inductively:

\[ S_{t+1} = a_t(a_{t-1}S_{t-1} + b_{t-1}) + b_t = S_0 \prod_{i=0}^t a_i + \sum_{i=0}^{t} b_i \prod_{j=i+1}^t a_j, \]

where \( \prod_{i=t+1}^t a_j = 1, \quad t = 0, 1, 2, \ldots. \)
Consider the case when the parameters $a_t, b_t$ are constant, independent of $t$, and are respectively equal $a, b$. This corresponds to a stable economy, with constant upper and lower prices, steady credit, and a fixed tax rate. Then the accumulation function (6) takes the form

$$S_{t+1} = a^{t+1} S_0 + b(1 + a + a^2 + \ldots + a^t), \quad t = 0, 1, 2, \ldots$$

(7)

Consider an example of economic growth under stable conditions.

Assume that the ratio $\frac{H_{t+1}}{H_t} = 1.55$ corresponds to the maximum level of the total trade margin in sales to the end user [2]; $H_{t+1} = H = 0, 2$, i.e., the sales revenue is taxed at 20%; $q = q = 0.9$, i.e., 90% of funds is used in turnover, while the remaining 10% pays for current expenses and consumption.

Assume that the buy-and-sell cycle is two months; $\Pi_{t+1} = \Pi = 0.1$, i.e., the interest rate is 10% for two months; $K_t = K$ is the two-month credit, which is available in a constant volume $K$. Under these conditions

$$a_t = a = 1, 55 \cdot (1 - 0, 2) \cdot 0, 9 = 1, 116,$$

$$b_t = b = \left(\frac{a}{0, 9} - 1, 1\right) \cdot K = 0, 14 \cdot K.$$

By (7), the accumulation of capital at the end of the year, after six two-month buy-and-sell cycles, is

$$S_6 = 1, 93 \cdot S_0 + 1, 125 \cdot K,$$

(8)

i.e., the capital increase is given by

$$S_6 - S_0 = 0, 93 \cdot S_0 + 1, 125 \cdot K.$$

(9)

Thus, during one year the initial capital $S_0$ will have increased by 93%, plus 112.5% of the constant amount of credit.

Let $S_0 = 400$ mill. karb., $K = 200$ mill. karb. Then by (7) $S_1 = 474, 4, S_2 = 557, 4, S_3 = 650, 1; S_4 = 753, 5, S_5 = 997, 8$ (mill. karb.). The capital increase is $\Delta S = S_6 - S_0 = 597.8$ mill. karb. in one year.

The amount available for current expenses and consumption is given by

$$C = \sum_{0}^{5} (1 - q) \cdot S_t = 370, 4 \text{ mill. karb.}$$

The actual accumulations from private commercial activities were much higher than the calculated amounts due to the use of subsidized credit and tax evasion. Thus, one third of private commercial businesses in Kiev did not have a license when inspected [3].

The effect of changes in the tax rate on income can be assessed by the derivative of (7):

$$\frac{\partial S_{t+1}}{\partial H} = - \frac{a}{1 - H} \left( (t + 1) a^t S_0 + \frac{K \cdot \varphi(t)}{q} + b \varphi'(t) \right),$$

(10)

where $\varphi(t) = 1 + a + a^2 + \ldots + a^t$.

In our example,

$$\frac{\partial S_6}{\partial H} = - \frac{1, 116}{0, 8} \left( 6 \cdot 1, 116^5 + 0, 5 \cdot 8, 033 + 0, 07 \cdot 20, 28 \right) = - 22, 7.$$

Thus, a 1% increase in the tax rate reduces the income by 22.7%. 

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