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## MARKETING OBJECT MODEL WITH CULULATIVE EFFECT

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Importance of the problem is conditioned by the wish of the companies to have clear answer to the question of how marketing influences the profitability namely what is marketing elasticity. Analysis of the previous periods helps defining coefficient of impact of marketing to the profit in current time period. Indicated information is instrument of analysis of effect of marketing solutions, defining period of influence of marketing campaigns and forming the budget.

As an economic model we consider the system of simultaneous equations dependency of the profit, marketing costs, accumulated marketing expenses, sales volume, cost of goods sold and gross domestic product per capita:

$$\begin{cases} u_t = f_1(a_t, A_t, q_t, c_t, y_t) \\ a_t = f_2(u_t, A_t) \end{cases}$$

where  $u_t$  – profit,  $a_t$  – marketing costs at a current period,  $A_t$  – accumulated marketing;  $q_t$  – sales volume,  $c_t$  – costs of goods sold.

Where  $u_t, a_t$  – endogenous variables,  $a_t, A_t, q_t, c_t, y_t$  exogenous variables. Indicated model is unidentified. [2]

For creation of the model of marketing volume with cumulative effect exponential dependance of sales volume from marketing in chosen [3].

$$u_t = \beta_0 a_t^{\beta_1} A_t^{\beta_2} q_t^{\beta_3} c_t^{\beta_4} y_t^{\beta_5}; \quad a_t = \gamma_0 u_t^{\gamma_1} A_t^{\gamma_2};$$

where  $\beta_0, \gamma_0$  – constant,  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \gamma_1, \gamma_2$  – corresponding elasticity.

Analysing profit logarithm from the sales volume econometric mode will have the following equation:

$$\begin{cases} \ln u_t = \beta_0 + \beta_1 \ln a_t + \beta_2 \ln A_t + \beta_3 \ln q_t + \beta_4 \ln c_t + \beta_5 \ln y_t + \varepsilon_{1t} \\ \ln a_t = \gamma_0 + \gamma_1 \ln u_t + \gamma_2 \ln A_t + \varepsilon_{2t} \end{cases}$$

For evaluating the system of simultaneous structural equations in which undervalued and overvalued equations are present two step least squares method is used.

The verification of the statistical significance of all modern ratios can be done using the t-statistics of Student's and Fisher's.

Consequently, the coefficient of elasticity of advertising on demand can be considered a coefficient  $\gamma_1$ .

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## MATHEMATICAL MODEL OF PUMPING OF DEEP CENTERS BY THE ENERGY OF LONGITUDINAL ACOUSTIC OSCILLATIONS AND ITS COMPUTER SOFTWARE

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The interaction of a hot electron with an electric dipole moment creates a torque that has a force that is inversely proportional to the scattering time. Because of the short-range action of quantum forces, the force at the center of mass of the perturbed DC is large and contributes to a decrease in symmetry [3].

If a part of levels is shifted downwards, the strong excitation of such a DC affords it the properties of an acceptor of the upper half of the forbidden zone. The shift of such energy levels to the center of the forbidden zone means an increase in the activation energy, which explains the observed increase in the threshold current of N-shaped