

UDC 004:45

DEVELOPMENT OF DECISION SUPPORT SYSTEMS AND OPTIMIZATION OF MANAGEMENT OF ECONOMIC AND BANKING SYSTEMS

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The value of the banking system in the world today, its impact on the economy should be reconsidered and estimated more accurately stateful information society and opportunities of modern information and communication technologies. The banking system in view of its information opportunities for receiving of reliable and timely economic data in real time can act as a "sensor" timely notice of the danger of the crisis. During too time the banking system is the main instrument of state regulation, lever, which when used properly will help keep the economy in a range of dynamic stability, which can be defined as "the acceptable range of wave of Schumpeterian." Managing capital market today is increasingly essential to manage the economic market. Information and communication opportunities available in the banking system, given the current technological capabilities of the society in the field of info-communications, are the basis for immediate and strictly factual assessment of the economic situation, predicting the development of various sectors of the economy and the economy in general and the elaboration of control actions are close to optimal. The fact that the banking system, which was originally established as a mechanism for the service economy, has evolved into an independent structure functioning in close relationship with the primal system and today has great information and analytical capabilities, is a reality and is related to the objective necessity of a functional solution of professional problems in today's world globalized economy. In this regard, the banking system can and should play a key role in stabilizing the economic system.

If we consider the world economy and the banking system as a set of clusters - economic and banking systems of the regions (group of countries, which can be described as a single entity in the global financial and economic system) or individual countries, without taking into account the relationships between the clusters, i.e., excluding the effect of globalization, control actions carried out in one of the clusters (in the banking and economic systems) may not produce the expected results on the stability or to ensure their desired dynamics. Moreover, after a certain time τ it is possible destabilizing effect of "boomerang" in the cluster - the donor, which is the source of investment "perturbations".

This problem is reflected in the "effect of spilling over" [1,2]. Discussion of the effect of "spilling over" in fact puts the question of improving decision support systems (DSS), the establishment of DSS appropriate current state of development of society, including at the level of the extremely difficult amenable to mathematical formalization [3], namely the level of behavioural motivation, morale and awareness of that the "transparency" of financial flows in the society is reality. An important element for the establishment and operation of such systems is the understanding and acceptance of the society need to open control structures generalized (not personalized) data, such as a full movement of financial flows in order to combat the financial and economic crisis and the need of general security in the realities of the existing the world community.

A necessary stage in the analysis is the mathematical formalization of the "spilling over" effect.

In order to study the possibility of the appearance effect of "spilling over" (which in a globalized economy is the effect of "communicating vessels") is necessary to generate a certain set of matrices and vectors. The required variables I and M (where I is some integrated indicator which must takes into account the demand for investment (I_c) and the marginal efficiency of

investment capital (I_e), M - is the money supply which demanding of profitable investments) will be represented as:

$$\begin{aligned} I &= I_{\text{households}} + I_{\text{corporations}} \\ M &= M_{\text{households}} + M_{\text{corporations}}. \end{aligned}$$

Allocation components for household and corporate (business, industry, production) due to the fact that in this article for simplicity, we assume that households are not a source of investments related to the effect of "spilling over".

Let us form a matrix of demand and the marginal efficiency of capital

$$I = [I_{ij}]$$

where the elements I_{ij} is an integral indicator of demand and the "marginal efficiency of capital" for the i -th branch of industry of j -th financial and economic cluster. In this paper, we assume that the parameters such as the degree of risk, time of "freezing" of capital, and others factors already taken into account in the formation of the elements matrix I .

Let us form vector of the attractiveness of savings S in the form of

$$S = [S_1 \ S_2 \ \dots \ S_N]^t$$

where S_j is the attractiveness of savings for the j -th financial and economic cluster, t - denotes transposition.

Let us form matrix velocity of money V_m (the same dimension that the matrix I) :

$$V_m = [V_{ij}]$$

where V_{ij} determines the velocity of circulation of money in the i -th branch of industry in j -th financial and economic cluster.

In the simplest case, to study the conditions of the occurrence of effect of "spilling over" it is possible restrict ourselves to analysis of matrix I . Then, if

$$I_{ij} < I_{iq}, \quad i, l = \overline{1, k}; j, q = \overline{1, N}, l \neq i$$

it can be expected that the effect of "spilling over" will be happen and positive expected effect for which the investment ΔI was injected to the cluster - donor can be not achieved.

When inequality

$$I_{ij} > \text{Sup}(I_{iq}), \quad i, l = \overline{1, k}; j, q = \overline{1, N}, l \neq i$$

is valid, than introduction of ΔI can give effect to the j -th financial-economic cluster.

When take into account the values of S and V_m , these above inequalities will be presented in the form of

$$\varphi(I_{ij}, V_{ij}, S) < \varphi(I_{ij}, V_{ij}, 0) \quad (1)$$

and

$$\varphi(I_{ij}, V_{ij}, S) > \varphi(I_{ij}, V_{ij}, 0), \quad (2)$$

where φ - some functions.

Similarly, if the inequality (1) rightly can be expected that the effect of "spilling over" happen, the fulfilment of the inequality (2) allow for the expected effect of the j -financial-economic cluster. In the right-hand side of inequality the variable of S in this consideration is omitted, since transfer "injection" capital in another cluster with the aim of savings unlikely.