N. S. Gonchar (Bogoliubov Institute for Theoretical Physics of NAS, Kiev, Ukraine)

Conditions of operation of economy systems in profitable regime

This report contains conditions on technological maps, describing the structure of production in economy systems, taxation system, the structure of supply of firms and the structure of choice of consumer that garantee operation of the economy systems in profitable regime with probability 1 at the state of economic equilibrium.

Theorem 1 *Let convex down technological maps* $F_i(x),\ x \in X_i^1,\ \ i = \overline{1,m}$, *belong to the CTM class in a wide sense, the set* R *be non-empty, the set of income functions be given by formulae (4.1.14), and let the structure of firms supply agree with the structure of consumers choice on the set* R_1, *fields* $y_i(p,z),\ i = \overline{1,l}$, *be continuous functions of* $(p,z) \in R_1$, *the conditions of one of the taxation system existence Lemmas 4.1.6 or 4.1.7 hold [1].*

If fields of information evaluation by consumers $\eta_i^0(p,z),\ i = \overline{1,l}$, *and a random field* $\zeta_0(p,\omega_0)$ *satisfy the conditions of the Theorem 4.1.4 [1], the condition (4.1.8) [1] holds, then the set of equations of the economy equilibrium*

$$\sum_{i=1}^{l} \frac{\mu_{ki}(p) D_i(p)}{\sum\limits_{j=1}^{n} \mu_{ji}(p) p_j} =$$

$$= \sum_{i=1}^{m} [Y_{ki}(p,z^0) - X_{ki}(p,z^0) + d_{ki}] + \sum_{i=1}^{l} b_{ki}, \quad k = \overline{1,n}, \tag{1}$$

has a solution in the set of strictly positive price vectors $p^0 = \{p_i^0\}_{i=1}^n$ *for every* $z^0 \in M_0$. *Such an economy system can operate profitably in the Walras equilibrium state if*

$$\langle y_i^0 - x_i^0, p^0 \rangle > 0, \quad i = \overline{1,m},$$

or subvention-profitably if

$$\langle y_i^0 - x_i^0 + d_i, p^0 \rangle > 0, \quad i = \overline{1,m},$$

for $b_i \neq 0$.

[1] N.S. Gonchar. Mathematical foundations of information economics. — Kiev: Bogoliubov Institute for Theoretical Physics, 2008.