

INTERNATIONAL CONFERENCE
ON
MICROECONOMIC ANALYSIS



LIBLICE CASTLE
20 - 24 MARCH, 1989

ABSTRACTS

INSTITUTE OF ECONOMICS
CZECHOSLOVAK ACADEMY OF SCIENCES

EQUILIBRIUM WITH NONSTANDARD PRICES IN EXCHANGE ECONOMIES

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The models of economic equilibrium are studied. The approach, based on applications of technique and methods of nonstandard analysis to economic equilibrium models, is proposed. The purpose of this innovation is to avoid Slater's condition, necessary for existence of usual equilibrium. The main idea involves introduction and study of properties of equilibrium with "nonstandard" prices but standard consumption plans of economic agents. In this construction standard prices are replaced by nonstandard ones and budget sets of agents are replaced by sets of the form:

$$\bar{B}_i(p) = \text{st } B_i(p) = \{x \in X_i \mid \exists y \in B_i(p) : y \approx x\},$$

where $B_i(p) = \{y \in X_i \mid \langle p, y \rangle \leq \langle p, w_i \rangle\}$ - is the set of nonstandard consumption plans, that satisfy the budget restriction ($X_i \subset R^L$ is the consumption set and $w_i \in X_i$ is the initial endowment of the i -th agent, L is the number of products, $p = (p_1, p_2, \dots, p_L)$ is the nonstandard prices). In exchange models of usual type the theorems of existence of "nonstandard" equilibria and their analogues have been proved. They don't require Slater's condition or its analogues (all other assumptions are standard). The equivalence between Pareto-optimal allocations and "nonstandard" Pareto equilibria is determined. The structure of budget sets and properties of budget mapping with non-standard prices are studied. In particular, if X_i is a polyhedron, then

$$B_i(p) = \left\{x \in X_i \mid e_j x = e_j w_i, j \leq m-1, e_m x \leq e_m w_i\right\},$$

where the series of orthonormal standard vectors $e_j, j \leq k \leq L, m \leq k$ is unambiguously determined by the vector of nonstandard prices from the relations

$$p = \sum_{j=1}^k \lambda_j e_j, \quad \lambda_j > 0, \quad \lambda_{j+1} / \lambda_j \approx 0.$$

Thus, with the help of nonstandard prices the idea of the economic equilibrium becomes more universal.