Shamraeva V. V. (Moscow, Russia) — **Some models of the financial market with an infinite number of buyers of shares.**

We consider arbitrage-free and incomplete (**B**,**S**)-market defined on the set $\{\Omega, \mathbf{F}\}$ where $\Omega = \{\omega_k\}_{k=1}^{\infty}$, $3 \le m \le \infty$, $\mathbf{F} = (\mathcal{F}_0, \mathcal{F}_1)$ is a one-step filtration ($\mathcal{F}_0 = \{\Omega, \emptyset\}$, $\mathcal{F}_1$ is the σ-algebra of all subsets of Ω). We denote with $Z = (Z_k, \mathcal{F}_k)_{k=0}^{1}$ an **F**-adapted random process, which we think of as the discounted value of shares ($Z_0 = a, Z_1(\omega_i) = b_i, b_i > 0, i = 1, 2, \ldots$). We say that the measure P satisfies **noncoincidence barycenter condition** (NBC), if $\sum\limits_{i=1}^{\infty} b_i p_i$ the series converges absolutely and $\forall I,\ J \subset N$ ($I \cup J = \emptyset$, $|I| \leqslant |J|$) the following inequality holds: $\frac{\sum_I b_i p_i}{\sum_I p_i} \neq \frac{\sum_J b_j p_j}{\sum_J p_j}$. A set of nondegenerate martingale measures (m.m.) P of the (B, S)-market will be denoted as $\mathcal{P}(Z, \mathbf{F})$ and set m.m. of the process Z satisfying NBC as defined NBC(Z).

Lemma 1. Let $b_1 < b_2 < b_3 < \ldots$. If

$$(b_i - b_{i-1}) \min_{1 \leqslant j \leqslant i-1} p_j > \sum_{j=i+1}^{\infty} b_j p_j, \quad \forall i \geqslant 2, \tag{1}$$

then the measure $P \in$ NBC.

For $P \in \mathcal{P}(Z, \mathbf{F})$ the inequality (1) for $i = 2$ results in $a < b_2$. For such measures, the theorem on non-emptyness of NBC(Z) in [1], with minor refinements, is also true.

Lemma 2. Let $\hat{P} = \{P \in \mathcal{P}(Z, \mathbf{F}) : b_i = \delta b_{i-1}, \forall i \geq 2; p_i = \frac{1}{\delta+1} p_{i-1}, \forall i \geq 3, \delta > 0\}$. Then $P \in \hat{P}$ does not satisfy NBC.

We note that if $p_2 \geq \frac{1}{\delta+1}$, then within Lemma 2 we have $a > b_2$.

Topical is the consideration of arbitrage-free complete markets i.e. markets for which $P \in$NBC(Z).

REFERENCES

1. *Pavlov I. V., Shamraeva V. V.* New results on the existence of interpolating and weakly interpolating martingale measures. Russian Mathematical Surveys, 2017, 72:4, 767–769.

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