

Recall 5

Abstract financial markets

1. What is the set of m -admissible (\mathbb{F}, \mathbb{P}) -wealth processes?
2. Let $m > 0$. Let $\mathcal{X}_m(\mathbb{F}, \mathbb{P})$ be a set of m -admissible (\mathbb{F}, \mathbb{P}) -wealth processes. Let $(X, X^1, X^2) \in \mathcal{X}_1(\mathbb{F}, \mathbb{P}) \times \mathcal{X}_2(\mathbb{F}, \mathbb{P}) \times \mathcal{X}_3(\mathbb{F}, \mathbb{P})$. Can you give two stability properties? Can you prove them?
3. Can you give an example of a set of m -admissible (\mathbb{F}, \mathbb{P}) -wealth processes?

On arbitrage opportunities and the first FTAP

1. Can you state the condition of absence of arbitrage (NA)?
2. Can you state the condition of no-free lunch (NFL)?
3. Can you state the condition of no-free lunch with vanishing risk (NFLVR)?
4. Can you state the condition of no-free lunch with bounded risk (NFLBR)?
5. Can you state the condition of no-unbounded profit with bounded risk (NUPBR)?
6. When is an \mathcal{F}_T -measurable random variable ξ called an arbitrage of the first kind?
7. Can you state some equivalences between conditions?
8. Can you state some inclusions between conditions?
9. Can you give two equivalent statements to “ $\mathcal{X}(\mathbb{F}, \mathbb{P})$ satisfies Condition (NFLVR)”? Can you prove it?

No-free lunch and Kreps–Yan’s theorem

1. Can you state the Kreps–Yan’s theorem? Can you prove it?
2. Can you state the Equivalence Separating Measure Condition (ESM)?
3. To which condition is (ESM) equivalent? Can you prove it?
4. Can you give three relations between Condition (ESM) and the sets $\mathcal{M}_\sigma(S, \mathbb{F}, \mathbb{P})$, $\mathcal{M}_{\text{loc}}(S, \mathbb{F}, \mathbb{P})$ and $\mathcal{M}(S, \mathbb{F}, \mathbb{P})$? Can you prove them?