Universidade de Lisboa
Instituto Superior de Economia e Gestão
Departamento de Economia

Master in Monetary and Financial Economics
Fundamentals of Financial Economics
2019-2020

Lecturer: Paulo Brito
Exam: **Época Normal** (First exam)
8.6.2020
Second part: 19:05 - 20:05

Warning:

- This is an online open book exam. This implies that in the assessment the following two points will be taken into consideration:
  1. In your answer to questions involving analytical derivations, please start with a **very short explanation** of your reasoning.
  2. Your answer should be concise, objective and specific. Any notation, calculation, motivation, discussion or explanation **not strictly related to the specific question** it tries to address will either not be considered or have a negative assessment.
- Points: 1(a) - 2, 1(b) - 2, 1(c) - 1, 2(a) - 0.5, 2(b) - 3, and 2(c) - 1.5.
- Your exam will only be considered if it is uploaded in Aquila between 20:05 and 20:10.

1 Consider a two-period intertemporal utility function, in a deterministic setting, for the consumption sequence $\{c_0, c_1\}$

$$U(c_0, c_1) = \Big((1-\mu)\, c_0^{\eta} + \mu\, c_1^{\eta}\Big)^{\frac{1}{\eta}}$$

for $0 < \mu < 1$ and $\eta \in (-\infty, \infty)$.

(a) After determining the intertemporal marginal rate of substitution, the Allen-Uzawa elasticities, and the elasticity of intertemporal substitution, characterize the possible types of behavior and therir dependence on the parameters μ and η.

(b) Assume a representative-agent Arrow-Debreu (AD) endowment economy, where the flow of endowment is $\{y_0, (1+\gamma)\, y_0\}$ and the price of AD contracts is denoted by q. Solve the representative agent problem. Discuss the response of the optimal consumption c_0 from changes in in q.

(c) Find the equilibrium AD price. Provide an intuition. In particular, discuss the relationship between the behavioral features you discussed in (a) and the equilibrium AD price (tip: observe that q is a discount factor, which means that $1/q = 1 + r$ where r can be interpreted as the risk-free interest rate for this economy).

2 Consider a two-period intertemporal utility function, in a stochastic setting, for the consumption sequence $\{c_0, C_1\}$ where $C_1 = (c_{11}, \dots, c_{1s}, \dots, c_{1n})$

$$U(c_0, c_1) = \Big((1-\mu)\, c_0^{\eta} + \mu\, \mathbb{CE}[C_1]^{\eta}\Big)^{\frac{1}{\eta}}$$

for $0 < \mu < 1$ and $\eta \in (-\infty, \infty)$, where $\mathbb{CE}[C_1]$ is the certainty equivalent of $\mathbb{E}[\,\ln(C_1)]$.

(a) Discuss the existence of risk aversion (Tip: compare $\mathbb{CE}[C_1]$ with $\mathbb{E}[C_1]$ for the cases in which C_1 is state independent and or it is state-dependent).

(b) Assume a representative-agent Arrow-Debreu (AD) endowment economy, where the flow of endowment is $\{y_0, (1+\Gamma)\, y_0\}$, where $\Gamma = (\gamma_1, \ldots, \gamma_n)$ is state-dependent. Solve the representative agent problem. Discuss the response of the optimal consumption c_0 to changes in q_s.

(c) Find the equilibrium stochastic discount factor, M^*. Find the covariance between M^* and $1+\Gamma$. Which signs this covariance can display ? Do they depend on the behavioral parameters of the model ?