

Financial Mathematics 2 - Fall term 2015

Exercise sheet no.2 (17.9.2015)

Exercise 1: Let $a, b \in \mathbb{R}$. Find a solution of

$$\begin{cases} dX_t &= e^{bt} dB_t - aX_t dt, \\ X_0 &= x_0 \in \mathbb{R}. \end{cases} \quad (1)$$

Is it unique?

Exercise 2: Calculate $E[X_t]$, and $\text{var}(X_t) := E[(X_t - E[X_t])^2]$ for $(X_t)_{t \geq 0}$ as in Exercise 1, and $X_0 = x_0 \in \mathbb{R}$. What is

$$\lim_{t \rightarrow \infty} E[X_t] \quad \text{and} \quad \lim_{t \rightarrow \infty} \text{var}(X_t) ?$$

Exercise 3: Prove Proposition 5.4 of the lecture.

Please drop the solutions into the homework box of the lecture until **24.9.2015, 6 pm**