

Homework Assignment #6
Due: In class, two weeks after distribution

§1 Shreve Vol. II Exercise 4.5

§2 Continuing with Shreve Vol. II Exercise 4.5

Suppose $S(t)$ is employed to model a foreign exchange rate. What is the stochastic differential equation governing $\frac{1}{S(t)}$?

§3 Shreve Vol. II Exercise 4.6

§4 Shreve Vol. II Exercise 4.7

§5 Shreve Vol. II Exercise 4.13

§6 Shreve Vol. II Exercise 4.15

Note: Exercise 4.16 is also very excellent. For those of you interested, regard it as a bonus question.

§7 An Integral

In class, we investigated stochastic integral with deterministic integrand. We have that

$$I(t) = \int_0^t s dW(s)$$

is normally distributed. Now, let us consider

$$J(t) = \int_0^t W(s) ds.$$

Amazingly, this is also normally distributed. Why? Find its mean and variance.