Financial Mathematics

MATH 5870/6870[1]
Fall 2021

Le Chen

lzc0090@auburn.edu

Last updated on

August 2, 2021

Auburn University
Auburn AL

[1] Based on Robert L. McDonald's *Derivatives Markets*, 3rd Ed, Pearson, 2013.

Chapter 18. The Lognormal Distribution

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Definition 18.1-1 A random variable X is said to have the *normal distribution* (or *normally distributed*) with mean μ and variance σ^2, if the probability density function (pdf) is given by

$$f_X(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}.$$

We write

$$X \sim N(\mu, \sigma^2).$$

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems

Chapter 18. The Lognormal Distribution

§ 18.1 The normal distribution

§ 18.2 The lognormal distribution

§ 18.3 A lognormal model of stock prices

§ 18.4 Lognormal probability calculations

§ 18.5 A. The expectation of a lognormal variable

§ 18.6 B. Constructing a normal probability

§ 18.7 Problems