Ergodicity economics: lecture plan

Ole Peters & Alexander Adamou

March 12, 2020

Tools

Lecture 1

Coin game. Random variable. Expectation value. Ensemble average.

Lecture 2

Stochastic process. Time average. Ergodicity.

Lecture 3

Random walk. Brownian motion. Stochastic differential equations.

Lecture 4

Geometric Brownian motion. Itô calculus.

Microeconomics

Lecture 5

Decisions in a riskless world.

Lecture 6

Decisions in a riskless world.

Lecture 7

Decisions in a risky world.

Lecture 8

Decisions in a risky world.

Lecture 9

Decisions in the real world.

Lecture 10

Decisions in the real world.

Macroeconomics

Lecture 11

Lognormal distribution. Two growth rates. Measuring inequality. Condensation.

Lecture 12

Rescaled wealth. Dynamics and distributions. Jensen's inequality. Power laws.

Lecture 13

Sums of lognormals. Random energy model.

Lecture 14

Farmer's fable. Cooperation in GBM. Correlated fluctuations. Idiosyncratic parameters.

Lecture 15

Reallocating GBM. Model regimes. Inverse gamma distribution.

Lecture 16

Ergodic hypothesis. US wealth data.

Lecture 17

Optimal leverage.

Lecture 18

Optimal leverage.

Lecture 19

Stochastic market efficiency.

Lecture 20

Stochastic market efficiency.