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Jim Murray

"Mathematical"

Biology

Normal

Easy
Formula
Two Params.
Transforms
C.L.T.

?

Fat tails

Empirical

Risk

Fooled

CRASHY

$$S.D = \sigma \, \delta t^{\alpha}$$

$$\alpha < 1/2$$
$$Var \rightarrow \infty$$
$$\alpha > 1/2$$
$$Var \rightarrow 0$$

$$M \delta t = t$$

$$\frac{\sigma^2 \delta t^{2\alpha} + \sigma^2 \delta t^{2\alpha} + \cdots}{M}$$

$$\boxed{\sigma \, \delta t^{\alpha}}$$

$$\boxed{\sigma^2 \delta t^{2\alpha}}$$

$$Var = \sigma^2 \delta t^{2\alpha}$$

$$\frac{t}{\delta t} \cdot \sigma^2 \delta t^{2\alpha} = \sigma^2 t \; \delta t^{\boxed{2\alpha - 1}}$$

$$\alpha = 1/2$$

$$\frac{S_i}{S(t)}$$

$$S_{i+1} - S_i = \mu S_i \, \delta t + \sigma S_i \cdot \phi \sqrt{\delta t}$$

$$\phi \sqrt{\delta t}$$

$$dS = \mu S \, dt$$

$$+ \sigma S \, dX$$

$$\frac{1}{S \, dt}$$

$$\frac{dS}{dt} = \mu S$$

O.D.E

$$S(t) = S_0 e^{\mu t}$$

drift

$$d\hat{q} = \frac{?}{\uparrow} \, dt + \frac{\uparrow}{} \, dX$$

drift

noise

S
r
p
σ

$$\frac{dS}{S} = \mu \, dt + \sigma \, dX$$

$$dr = (\quad) \, dt$$

$$dX$$