Modelling Inflation as a Random Process

S. Rawal and G. J. Rodgers

Department of Mathematical Sciences, Brunel University,

Uxbridge, Middlesex UB8 3PH, U.K.

Abstract

We introduce a model of inflation in which the prices of commodities are inflated by a random process. At each time step a price x is selected with a rate of x^{α} and is inflated by a factor of $1/\beta$ where $0 < \beta < 1$. For $\alpha = 0$, we obtain a general time-dependent solution, where the initial price distribution can be of any form. When $\alpha > 0$, in the long time limit, only the highest price inflates. For $\alpha < 0$, the model exhibits asymptotic scaling behaviour. We also consider the effects of a time dependent β, where $0 < \beta(t) < 1$, for the case $\alpha = 0$. We find that the price distribution approaches a steady state if $\beta(t) - 1 \sim 0$ faster than $1/t$.

Keywords: inflation, power-laws, scaling

PACS numbers: 02.50.cw, 05.40.-a, 89.75Hc.