ON THE MARTINGALE PROPERTY OF STOCHASTIC EXPONENTIALS

BERNARD WONG,∗ UNIVERSITY OF NEW SOUTH WALES AND AUSTRALIAN NATIONAL UNIVERSITY
C. C. HEYDE,** AUSTRALIAN NATIONAL UNIVERSITY AND COLUMBIA UNIVERSITY

Abstract

We present a necessary and sufficient condition for a stochastic exponential to be a true martingale. It is proved that the criteria for the true martingale property is related to whether a related process explodes. Applications of our theorem to problems arising in mathematical finance are also given.

Keywords: Explosion; Martingale Property; Equivalent Local Martingale Measures.

AMS 2000 Subject Classification: Primary 60H30
Secondary 91B28

∗ Postal address: SCHOOL OF ACTUARIAL STUDIES, UNIVERSITY OF NEW SOUTH WALES, SYDNEY NSW 2052, AUSTRALIA. EMAIL ADDRESS: BERNARD.WONG@UNSW.EDU.AU
** Postal address: MATHEMATICAL SCIENCES INSTITUTE, AUSTRALIAN NATIONAL UNIVERSITY, CANBERRA ACT 0200, AUSTRALIA.