

Bond Prices Via Nuclear Space Valued Semi-Martingales

Hayri Korezlioglu¹ and Suhan Altay²

¹Institute of Applied Mathematics, Department of Financial Mathematics,
Middle East Technical University, Ankara, Turkey

hayri@metu.edu.tr

²Institute of Applied Mathematics, Department of Financial Mathematics,
Middle East Technical University, Ankara, Turkey

²Department of Business Administration, Middle East Technical University
altay@metu.edu.tr

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ABSTRACT

In this work we consider the martingale(no arbitrage) condition of discounted zero-coupon bond prices when stochastic components of the forward rate are stochastic integrals on a pair of nuclear spaces in duality. The construction of the stochastic integrals is based on the approach of [1]. Here we first take the case of the stochastic integral with respect to square integrable nuclear space-valued martingales. We explicit the role of the continuous and discontinuous parts in order to point out the similarities of our result with those of known classical ones. We present a particular case where the discontinuous part stems from a Markov Jump Process. The last example in the paper concerns a nuclear space valued Levy Process generating the martingale with respect to which the stochastic integral is taken.

References

- [1] Korezlioglu H. and C. Martias Stochastic Integration for Operator Valued Processes on Hilbert Spaces and on Nuclear Spaces, Stochastics, Vol.24, pp. 171–219, 1988.