ISSN 1068-3623, Journal of Contemporary Mathematical Analysis (Armenian Academy of Sciences), 2021, Vol. 56, No. 3, pp. 134–142. © Allerton Press, Inc., 2021.
Russian Text © The Author(s), 2021, published in Izvestiya Natsional'noi Akademii Nauk Armenii, Matematika, No. 3, pp. 79–91.

PROBABILITY THEORY

Causality Between Stopped Filtrations and Some Applications

D. Valjarević[1,2*] and Lj. Petrović[1,2]**

[1]*University of Pristina-Kosovska Mitrovica, Kosovska Mitrovica, Serbia*

[2]*University of Belgrade, Belgrade, Serbia*

Received February 17, 2020; revised June 12, 2020; accepted July 10, 2020

Abstract—In this paper we consider the concept of statistical causality in continuous time between filtrations associated with stopping times, which is based on Granger's definition of causality. Especially, we consider a generalization of a causality relationship "$\mathbf{H}$ is a cause of $\mathbf{E}$ within $\mathbf{F}$" from fixed to stopping time. Then we apply the given concept of causality to strongly orthogonal stopped martingales. We show the equivalence between the given concept of causality and orthogonality of stopped local martingales, too.

MSC2010 numbers: 60G44, 60H07, 60H10, 62P20.
DOI: 10.3103/S1068362321030080

Keywords: *filtration; causality; stopped local martingales; stopped orthogonal martingales.*