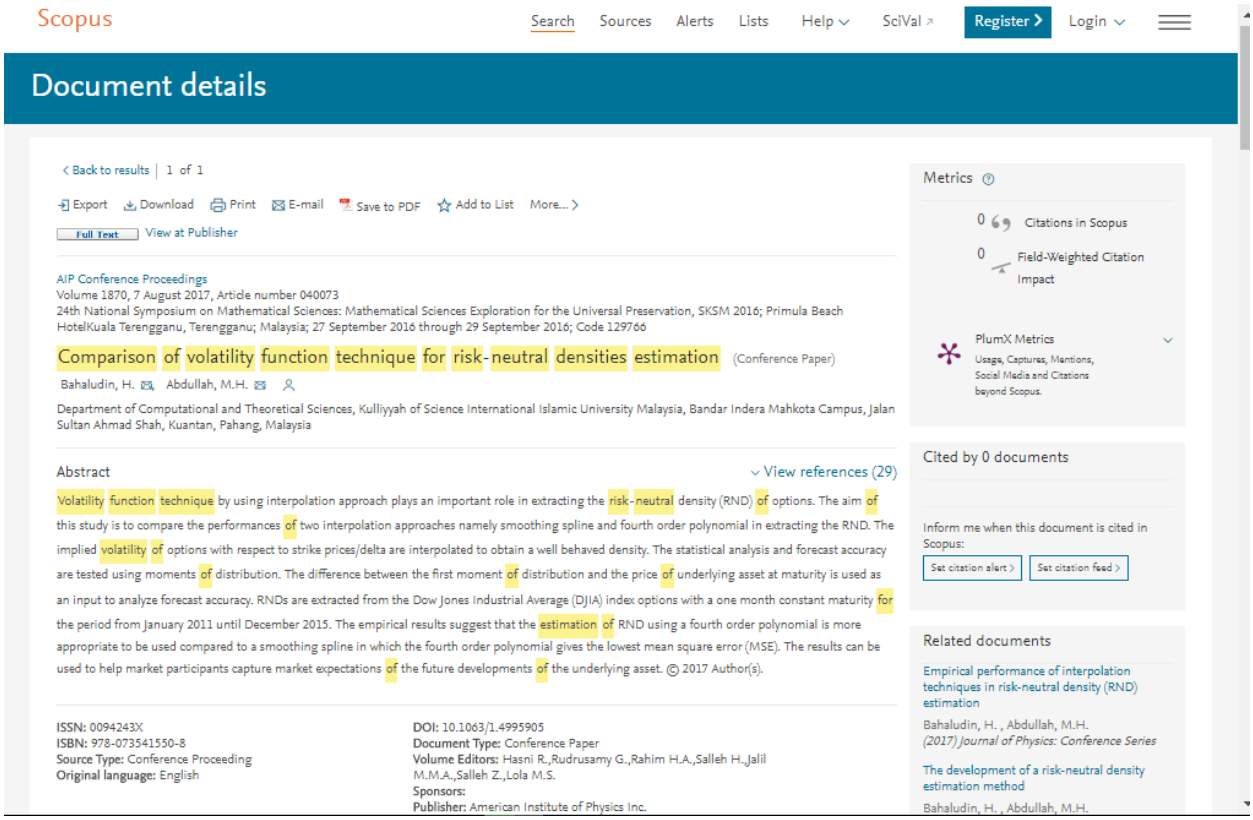
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Comparison of volatility function technique for risk-neutral densities estimation (Conference Paper)
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Abstract
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Volatility function technique by using interpolation approach plays an important role in extracting the risk-neutral density (RND) of options. The aim of this study is to compare the performances of two interpolation approaches namely smoothing spline and fourth order polynomial in extracting the RND. The implied volatility of options with respect to strike prices/delta are interpolated to obtain a well behaved density. The statistical analysis and forecast accuracy are tested using moments of distribution. The difference between the first moment of distribution and the price of underlying asset at maturity is used as an input to analyze forecast accuracy. RNDs are extracted from the Dow Jones Industrial Average (DJIA) index options with a one month constant maturity for the period from January 2011 until December 2015. The empirical results suggest that the estimation of RND using a fourth order polynomial is more appropriate to be used compared to a smoothing spline in which the fourth order polynomial gives the lowest mean square error (MSE). The results can be used to help market participants capture market expectations of the future developments of the underlying asset. © 2017 Author(s).
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