

Analyzing Volatility Through Machine Learning: A Review

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Abstract

Recently, the use of machine learning (ML) in scientific disciplines has experienced an unprecedented increase. This, as a consequence of the advances in computing that have allowed the obtaining of satisfactory results at moderate computational costs. Finance has not been an exception. Several works have been published in recent years using ML techniques. However, one of the topics with the least number of developed papers in this context is volatility. This panorama has changed. Data obtained from the Web of Science database show that for the years 2001 and 2010 there were 2 and 1 papers associated with this topic, respectively. Surprisingly, between 2019 and 2021, 37 manuscripts have been published related to this theme. The purpose of this work is to review the Works related to the applications of ML in volatility. For this, a classification of the main proposals on this topic is proposed, accompanied by a statistical and bibliometric analysis in which novel techniques such as K-means are used. The results are suggestive. Although most papers focus on volatility prediction through neural networks and support vector machine, there is a lack of works related to volatility transmission, calibration of volatility surfaces, project finance and corporate finance.

Keywords: Bibliometric analysis, financial literature, K-means, Machine learning, Volatility.