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# An evolving possibilistic fuzzy modeling approach for Value-at-Risk estimation

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## Abstract

Market risk exposure plays a key role in risk management. A way to measure risk exposure is to evaluate the losses likely to incur when the assets prices of a portfolio decline. Most financial institutions rely on Value-at-Risk (VaR) estimates to measure downside market risk. This paper suggests an evolving possibilistic fuzzy modeling (ePFM) approach to estimate VaR. The approach is an extension of the possibilistic fuzzy c-means clustering and functional fuzzy rule-based modeling within the framework of incremental learning. Evolving possibilistic modeling employs memberships and typicalities to update the cluster structure and corresponding fuzzy rules using a statistical control distance-based criterion. A utility measure evaluates the quality of the current cluster structure and associated model. Data from the main global equity market indexes of United States, United Kingdom, Germany, Spain, and Brazil from January 2000 to December 2012 are used to estimate VaR using ePFM. The performance of ePFM

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