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VARES CALCULATOR: A MOBILE APPLICATION TO ESTIMATE MARKET RISK

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Abstract

Value-at-Risk or VaR has been widely used as the main measure for market risk since its inception in 1996 by JP Morgan. VaR is used to estimate and quantify general market risk which includes interest rate risk, equity risk, commodity risk and exchange rate risk within specific time horizon. VaR signifies the potential value of loss of an investment of portfolio given specific amount of probability of loss (usually 95%) and time horizon (usually 1 day for liquid stock). The estimation of VaR is very crucial especially to the regulator and financial institution such as bank to gauge the amount of capital needed to cover their potential losses. All this while, the banking industry uses Historical Simulation (HS) technique to estimate their market VaR due to its simplicity to allow a quick decision making transpire. However, our study as well as some previous studies found that HS is inaccurately explaining the real behaviour of market condition since it is unable to capture the volatility clustering within the stock returns. Therefore, we develop a mobile application version to calculate VaR by using Exponentially Weighted Moving Average model to cater the volatility clustering exhibit by the stock returns. The mobile application assists various parties including banking industry as well as individual investor to assess their market risk exposure at the tip of their fingers. More interestingly, our mobile application also incorporates the calculator of its counterpart Expected Shortfall since it can provide the average of worst loss from the VaR quantile. Hence, user can have more option whether to look on the VaR or even ES. This novelty will contribute a new dimension towards the financial risk management in assessing the market risk exposure more precisely and conveniently.