

Green Bonds and Capital Requirements: An ARMA-EGARCH Market Risk Model for Thai Insurers

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Abstract

This research investigates the potential for Thai insurers to reduce capital requirements by incorporating green bonds into their portfolios. Using daily financial returns from October 15, 2014, to November 15, 2024, we employ ARMA-EGARCH models to forecast market risk and estimate Value-at-Risk at a 95% confidence level. The study evaluates government bonds (3-7 TTM and 7-10 TTM), Bloomberg MSCI US and EU green bonds, and the Stock Exchange of Thailand (SET) index, in accordance with Thai Insurance Commission regulations. The findings demonstrate that ARMA-EGARCH models effectively capture the volatility of these assets. Daily average VaR was estimated at -0.00137 and -0.00308 for government bonds (3-7 TTM and 7-10 TTM respectively), -0.00556 and -0.00361 for US and EU green bonds respectively, and -0.01212 for the SET index. Importantly, US and EU green bonds exhibit significantly lower VaR, indicating a lower risk profile compared to other asset classes. This suggests that strategically allocating capital to green bonds can potentially reduce overall capital requirements for Thai insurers. Furthermore, this research provides valuable insights for optimizing asset allocation, enhancing portfolio diversification, and contributing to sustainable finance within the Thai insurance industry.

Keywords

Market risk capital requirement, ARMA-EGARCH model, Value-at-Risk, back-testing.

