African Pure Mathematics Quarterly (Pure Science)

Functional Analysis under Monte Carlo Estimation for Financial Risk Assessment in Ghana: Variance Reduction Techniques

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Published: 17 June 2009 | **Received:** 04 March 2009 | **Accepted:** 26 April 2009

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DOI: 10.5281/zenodo.18891275

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Abstract

In financial risk assessment in Ghana, traditional methods often rely on historical data for model building, which may not accurately predict future market conditions. Theoretical development focusing on stochastic processes and their application in estimating financial risks under uncertainty, incorporating variance reduction methods such as control variates and importance sampling. Theoretical framework provides a robust methodology for financial institutions operating in Ghana, offering improved accuracy in risk assessment and management. Financial institutions should consider implementing the proposed variance reduction techniques as part of their risk management strategies. The analytical core is $\hat{\{} y\} t = mathcal\{F\}(xt;\theta)$ with $\hat{\{}\theta\} = argmin_{\theta} L(\theta)$, and convergence is established under standard smoothness conditions.

Keywords: *Ghana, Functional Analysis, Monte Carlo Method, Variance Reduction, Stochastic Processes, Risk Theory, Econometrics*

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