

**TRACKING SOUTH AFRICAN ALL-SHARE INDEX USING EXCHANGE
RATES: A KALMAN FILTER APPROACH***

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Movements in the Rand/Dollar exchange rate have a direct impact on the Johannesburg Stock Exchange All-Share Index (JSE ALSI). In our analysis, we find that more than 80% of the change in the JSE ALSI is explained by movements in the Rand/Dollar exchange rate. This paper employs three techniques to study this relationship namely, the Ordinary Least Squares Method, the Random Walk Model, and the Kalman Filter. We use these techniques to determine their forecasting power, both in-sample and out-of sample. We find the Kalman Filter and the Random Walk model to be better techniques than the OLS because they both have lower root mean squared errors. We further find that the Kalman Filter outperforms the Random Walk Model in in-sample forecasting but fails to do so in out-of-sample forecasting. However, the difference between the two is minimal. We conclude that the Kalman Filter is a powerful estimation technique whose forecasting ability is almost on par with the Random Walk Model.

Key words: Kalman Filter, State-Space model, Exchange rate volatility, Stock market volatility, Ordinary Least Squares, Random Walk

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