Long Memory and ARFIMA Modelling: The Case of CPI Inflation for Ghana and South Africa

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Abstract : This study examines long memory or long-range dependence in the CPI inflation rates of Ghana and South Africa using Whittle methods and autoregressive fractionally integrated moving average (ARFIMA) models. Standard I(0)/I(1) methods such as Augmented Dickey-Fuller (ADF), Philips-Perron (PP) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests were also employed. Our findings indicate that long memory exists in the CPI inflation rates of both countries. After processing fractional differencing and determining the short memory components, the models were specified as ARFIMA (4,0.35,2) and ARFIMA (3,0.49,3) respectively for Ghana and South Africa. Consequently, the CPI inflation rates of both countries are fractionally integrated and mean reverting. The implication of this result will assist in policy formulation and identification of inflationary pressures in an economy.

Keywords : Consumer Price Index (CPI) inflation rates, Whittle method, long memory, ARFIMA model
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