Chapter 10
Machine Learning Model to Predict Gold Prices for Zimbabwean Economy

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ABSTRACT

This Research tackled this insight into Gold prices by producing a predictive Machine Learning Model based on ARIMA, Seasonal Naïve and SARIMA algorithms. These algorithms were extensively evaluated in their performance to predict- Gold prices in Zimbabwe as a key aspect of this Research. Factors impacting on the fluctuation of Gold prices especially in the Zimbabwean economy were also to be identified in the course of the Research to provide suitable variables akin to model performance. Results garnered from the course of the research clearly point out that ARIMA and SARIMA models proved more effective in the analysis of stationery time series data and these models produced a confidence level of above 96% on model fitness indicating high levels of model performance. Limitations were identified in past data availability for effective model training and recommendations were made for future data recordings and collation.

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1.0 BACKGROUND

The Zimbabwean economy has incurred a debilitating downturn over the past five years resulting in the eroding of the average persons' purchasing power of falling to almost the same levels as in 1953. The contraction of the economy in real terms in each of the past five years, coupled with three digit levels of inflation digits has resulted in the local currency to lose 99% of its value. The benchmark of the Zimbabwe's economy has been recession pre the COVID-19 causing in effect a contracting by 6.0% in 2019. This economic instability coupled with other policy misbehavior such as the taking away of subsidies on maize meal, fuel, and on the prices of electricity, contracted foreign exchange earnings and caused excessive money creation. The coming in of the COVID–19 pandemic and continuous drought to precipitated a 10% contraction in real GDP in 2020. The institution of Foreign Exchange policy reforms in the period June 2020 arrested d an inflation that had soared to an annual rate of 838% in July. Fiscal and current account deficits also recovered after July 2020, but both were to deteriorate for the whole of 2020. The budget deficit went up from 2.7% in 2019 to 2.9% in 2020, just as the current account moved from a surplus of 1.1% of GDP in 2019 to a deficit of 1.9% in 2020 (BANK, 2021). One of the critical commodities that is utilized as a yardstick of economic activity prevailing in the globalized world still remains as Gold. The price of the gold is reliant on economic indicators such as the global financial situation is terms of growth scenario, economic stagnation, recession, and depression cycle (Farahani, 2013). The characteristics of gold can hence be utilized as a hedging tool to provide a safe investment haven in times of economic downturn.

1.1 Statement of the Problem

The Zimbabwe's ministry of finance and economic development is dedicated towards maintain a stabilized economy with sufficient circulation of money all the time. This is achieved by monitoring the inflation levels as well as economic activities. The major focus of this Ministry is to keep the economy favorable for investments. Unfortunately, this could not be achieved due to hyper-inflation levels in Zimbabwe. Inflation skyrocketed, averaging 622.8% in 2020, up from 226.9% in 2019. The introduction of Foreign exchange policy reforms in June 2020, somewhat dampened an inflation that had risen to an annual rate of 838% in July. Fiscal and current account deficits also somewhat recovered after July, but both went down for the year as a whole. The budget deficit went up from 2.7% in 2019 to 2.9% in 2020 (BANK, 2021). The exchange rate depreciated ZWL2.5 in February 2019 and stabilizing around ZWL82 to the US dollar in December 2020. In recent times, due to the economic recession brought in by COVID-19 pandemic, individuals are