Saemi Ramirez

011926418

D214 PA 3

Presentation of  
Findings

2/2/2025

WGU

1. Develop an executive summary using the data from task 2
   1. Statement of the problem and the hypothesis  
       The research question is, “How accurately can the gold price be predicted?”. The null hypothesis of this research question is if the gold price can be predicted at 90% accuracy, and the alternate hypothesis is if the gold price can be predicted with less than 90% accuracy.
   2. Summary of the data-analysis process  
       The data (Prices.xlsx) was sourced from the official website of the World Gold Council ([www.gold.org](http://www.gold.org)). The “Weekly\_EoP” sheet was used for this research from December 29, 1978, to November 22, 2024.   
      After reading the Prices.xlsx on Jupyter, all the columns except the date and USD were removed. The data was checked for null values; then, the date column was used as an index and saved as “cleaned\_data.” The line chart with the trend line and the seasonal\_decompose to see the trend, seasonal, and residue graphed for the visualization. The “cleaned\_set” was divided into the train (from December 29, 1978, to December 25, 2020) and the test (from January 1, 2021, to November 22, 2024) sets. The auto\_arima function was used to find the best model for ARIMA with the train set, and the result was the best ARIMA model (1, 1, 0). The ARIMA function was tested with the best ARIMA model, and the result was visualized in the plot\_diagnostics function for the standardized residual for “U,” histogram plus estimated density, normal Q-Q, and correlogram. The 204 rows of gold prices were forecasted based on the ARIMA model study from the train set, and the forecasted gold prices were then compared with the actual gold prices in the test set. It was also graphed to understand better, with blue as the actual gold price and green as predicted.
   3. Outline of the findings  
       The RMSE (Root Mean Squared Error) was calculated to check the accuracy of this time series, which resulted in 273.335489. The RMSPE (Root Mean Squared Percentage Error) function was used to convert this into a percentage, resulting in 11.420910%, which means the accuracy of this time series is 88.579090% (100% - 11.420910%).
   4. Explanation of the limitations of the techniques and tools used  
       The time series model achieved an accuracy of 88.6%, effectively identifying underlying trends, seasonality, and cyclic behaviors in gold prices. This capability can provide valuable insights for broader economic strategies, as inflation rates, currency fluctuations, and geopolitical events often influence gold prices. However, a limitation of this analysis is that the dataset included only dates and weekly gold prices, without additional variables that could impact gold prices. The screenshot below illustrates the model’s prediction of gold prices starting from 2011-03-04, using a 7:3 train-test split. The training set showed a steady upward trend with minimal fluctuations, contributing to the model achieving an 80% accuracy for this prediction compared to the train-test sets ratio of 91.5 and 8.5 in this study.
   5. Summary of proposed actions  
       The time series model’s predictions can help individuals capitalize on gold price fluctuations by purchasing during dips and selling during peaks. Gold is also a reliable safe-haven asset during economic uncertainty or high inflation.
   6. Expected benefits of the study (specific and quantitative)  
       This may benefit investors who want to grow their assets with the gold. According to the Prices.xlsx, the gold price per ounce on December 29, 1978, was $226, exceeding over $2,000 in 2023.
2. Present the project to a non-technical audience
   1. Brief introduction of yourself and your background
   2. Statement of the problem and hypothesis
   3. Summary of the data-analysis process
   4. Outline of the findings
   5. Explanation of the limitations of the techniques and tools used
   6. Summary of proposed actions
   7. Expected benefits of the study (specific and quantitative)
   8. Discussed in the presentation
   9. Panopto Link: <https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=cd31edf3-eb31-4a10-94e7-b278016a54da>
3. In-text citations and references  
   N/A