Industrial Engineering Journal
ISSN: 0970-2555
Volume : 53, Issue 11, November : 2024

STOCK MARKET ANALYSIS USING SUPERVISED MACHINE LEARNING

DR. P. Vishvapathi
Professor and HOD
Department of CSE
Deccan College of Engineering and Technology
Affiliated to Osmania University,
Hyderabad, Telangana
vishvapathi@deccancollege.ac.in

Shaik Saleem,
PG Scholar,
Department of CSE
Deccan College of Engineering and Technology,
Affiliated to Osmania University,
Hyderabad, Telangana
shaiksaleem2831@gmail.com

***Abstract*— This raising value of gold coupled with the volatilities and fall in prices of other markets like capital markets and real estate markets has attracted more and more investors towards gold as an attractive speculation. But, of late price of gold is also witnessing high volatility and speculations in gold are turning to be riskier. There is a fear as to whether these high prices are sustainable and when the prices would reverse. Even though there are a number of studies analyzing the correlation between the price of gold and some economic variables. It is still considered that a study to reveal the influence and impact of various macro-economic factors on the price of gold in the present situation will be helpful in determining the dynamic effects of these relationships. Thus this paper is aimed at studying the relationship between gold price and selected economic and market variables. Understanding such relationship will be helpful not only to monetary policymakers but also to investors, fund managers, and portfolio managers to take better speculation decisions in the market. Further, this study uses three machine learning algorithms, linear regression, random forest regression, and gradient boosting regression in analyzing these data. Comparison of these three methods will help us in identifying the accuracy of these methods under various conditions. This paper is structured with literature review in the next section followed by sections on data and methodology, results and discussion, and conclusion.**

***Index Terms*— Traffic surveillance, accident detection, action recognition, smart city, autonomous transportation, deep learning**

I. INTRODUCTION

Accumulations and Speculations constitute an indispensable component of everyone's existence. Speculations refer to the utilization of present assets with an objective of earning a favorable return on investment in the future. In an economic sense, a speculation can be considered as the procurement of assets that are not consumed today but are utilized in the future to generate wealth. In finance, a speculation is the procurement of a monetary asset with the idea that the asset will provide income in the future or will later be sold at a higher price for a profit. The Indian economy being one of the fastest growing in the world has resulted in higher disposable income levels and a plethora of speculation avenues. There are a number of speculation avenues available for investors, which includes equities, deposits, commodities, and real estate. Each of them differs in terms of risk and return characteristics. Gold is another asset which is being considered as an attractive speculation avenue by many investors due to its increasing value and the area of usage. Investor's preference for gold as a protective asset increases due to their negative expectations concerning the situation in the developed foreign exchange markets and the capital markets. Gold is also considered to be

"the asset of final instance" i.e. is the asset investors rely on, when the developed world capital markets are not capable to provide desirable profitability. Thus it can be said that investors see gold as a tool to hedge against the fluctuations in other markets. Gold is a precious metal, so like any other goods; gold's price should depend on supply and demand. But, since gold is storable and the supply is accumulated over centuries, this year's production has little influence on its prices. Gold is used both as a commodity and as a financial asset. Gold behaves less like a commodity than long-lived assets such as equities or bonds. Price of gold depends on a myriad of interrelated variables, including inflation rates, currency fluctuation, and political turmoil.

If governments can potentially default on debt denominated in their own currency, then their borrowing costs should reflect both currency and credit risk. In order to study the credit risk on local currency sovereign debt, we introduce a simple model-free empirical measure of emerging market sovereign credit risk on LC denominated debt, the local currency credit spread, and contrast this new measure with the conventional measures of emerging market sovereign risk based on foreign currency (FC) denominated external debt. Despite the increasingly important role of local currency (LC) debt for emerging market sovereign issuers and its increasing share in the portfolio of domestic and foreign investors, emerging market LC debt markets are little understood and explicit LC sovereign risk measures are absent from the academic literature. When sovereigns borrow in their own currency, foreign lenders face the risk that the sovereign will repay but in a depreciated currency and the risk that the country will outright default on the debt or impose capital controls for repatriation of capital. In this paper, we present a new metric to disentangle the risk of currency depreciation (currency risk) from outright default and capital controls (credit risk). In our 10 sample countries for the sample period 2005-2011, the mean spread of LC nominal yields over U.S. Treasuries is equal to 5 percentage points. Our decomposition attributes 3.72 percentage points to currencyfma risk and the other 1.28 percentage points to the credit risk. We define the LC credit spread as the difference between the nominal yield on an LC bond and the LC risk-free rate implied from the cross-currency swap (CCS) market. While government bond yields are often used directly as the risk-free rate for developed country currencies, they cannot be used as the risk-free rate in emerging markets where the risk of sovereign default and capital controls are non-negligible. Instead, we use the dollar risk-free rate combined with the long-term forward rate implied from currency swap markets as the risk-free benchmark in each LC. From a dollar investor's perspective, the LC credit spread is equivalent to the synthetic dollar spread on an LC bond over the U.S. Treasury rate with the currency risk of promised cash flows fully hedged using cross-currency swaps. By holding an LC bond and a currency swap with the same tenor and promised cash flows, the dollar investor can lock in the LC credit spread even if the value of the currency plummets as long as explicit default is avoided. From the sovereign issuer's perspective, the LC credit spread measures the synthetic dollar borrowing cost in the LC debt market. Understanding the credit risk on local currency sovereign debt is important for several reasons. First, from total sovereign financing perspective, total LC debt outstanding in 2011 was on average 5-6

times greater than FC debt outstanding in our sample countries (BIS, 2013).

II. LITERATURE REVIEW

1.1 Domestic Currency Government Risk, Social Science Investigation Network

AUTHORS: Wenxin Du, Jesse Schreger, Tarek Abdelzaher1 , Yixin Diao2 , Joseph L. Hellerstein3.

ABSTRACT: We examine the issue of organizing International Space Station (ISS) astronaut instruction with various aims. A predetermined collection of baseline proficiency standards should be allocated among team participants with minimal disparities in training duration, instructional costs, or maximal educational attainment within budgetary constraints. Initially, an overview of the astronaut preparation procedure is provided. Subsequently, four frameworks are analyzed for the capacity planning challenge. The goal of the initial framework is to reduce discrepancies in total preparation time across all team participants; the second framework aims to minimize instructional expenses while maintaining a specific training standard; and the third framework seeks to maximize educational attainment within fiscal limitations. The fourth framework approaches the issue as an n-way division problem. Afterwards, two frameworks are examined for the scheduling planning challenge. We investigate the matter of arranging ISS astronaut instruction with multiple objectives. A preset array of baseline proficiency standards should be distributed among team participants with minimal disparities in training duration, instructional costs, or maximal educational attainment within budgetary constraints. Initially, an outline of the astronaut preparation procedure is furnished. Subsequently, four frameworks are scrutinized for the capacity planning challenge. The purpose of the initial framework is to diminish discrepancies in total preparation time across all team participants; the second framework strives to curtail instructional expenses while preserving a specific training standard; and the third framework endeavors to enhance educational attainment within fiscal limitations. The fourth framework tackles the issue as an n-way division problem. Afterwards, two frameworks are explored for the scheduling planning challenge. We probe the quandary of coordinating ISS astronaut instruction with diverse goals. A predetermined set of baseline proficiency criteria should be apportioned among crew members with minimal disparities in training duration, instructional costs, or maximal educational attainment within budgetary constraints. To begin, a synopsis of the astronaut preparation process is supplied. Following this, four frameworks are dissected for the capacity planning dilemma. The aim of the initial framework is to lessen discrepancies in total preparation time across all crew members; the second framework endeavors to reduce instructional expenses while maintaining a specific training benchmark; and the third framework strives to boost educational attainment within fiscal restrictions. The fourth framework addresses the issue as an n-way partition problem. Subsequently, two frameworks are investigated for the scheduling planning predicament. Do administrations renege on obligations denominated in their domestic currency? We introduce a novel gauge of sovereign credit peril, the domestic currency credit differential,

characterized as the disparity between domestic currency bonds and the synthetic domestic currency risk-free rate constructed using cross-currency swaps. We discover that domestic currency credit differentials are affirmative and substantial. Juxtaposed with credit differentials on foreign currency denominated obligations, domestic currency credit differentials exhibit lower averages, reduced cross-country correlations, and diminished sensitivity to global risk elements. Global risk aversion and liquidity components can elucidate more temporal variation in these credit spread discrepancies than macroeconomic fundamentals.

1.2 Forecasting gold prices using multiple linear regression method.

AUTHORS: 1Z. Ismail, A. Yahya and A. Shabri

ABSTRACT: Issue description: Prognostication serves as a managerial tool to aid in decision-making processes. It is additionally characterized as the methodology of estimating unforeseen future circumstances. In broader terms, it is commonly referred to as prediction, which denotes the estimation of chronological or longitudinal data sets. Aurum is a valuable yellow resource previously utilized as currency. It was prohibited in the United States four decades ago but has recently regained acceptance as a potential medium of exchange. The requirement for this resource is escalating. Methodology: The aim of this investigation was to construct a predictive framework for anticipating aurum valuations based on fiscal indicators such as inflationary pressures, monetary unit fluctuations, and additional factors. Following the depreciation of the American dollar, financiers are allocating their assets to aurum due to its pivotal role in stabilizing investment portfolios. Owing to the surge in demand for aurum in Malaysia and globally, it is crucial to devise a framework that mirrors the composition and trends of the aurum market and forecasts aurum price movements. The most suitable approach for comprehending aurum valuations is the Multiple Linear Regression (MLR) framework. MLR examines the correlation between a solitary dependent variable and one or more independent variables, with aurum price serving as the lone dependent variable in this instance. The calibrated MLR framework will be employed to prognosticate future aurum valuations. A rudimentary model dubbed "forecast-1" was designated as a reference framework to assess the performance of the developed model. Outcomes: Numerous factors influence aurum valuations, and based on "expert intuition," several fiscal indicators were identified as having an impact on aurum prices. Variables such as the Commodity Research Bureau future index (CRB); USD/Euro Foreign Exchange Rate (EUROUSD); Inflation rate (INF); Money Supply (M1); New York Stock Exchange (NYSE); Standard and Poor 500 (SPX); Treasury Bill (T-BILL); and US Dollar index (USDX) were deemed to exert influence on the valuations.

III. EXISTING METHODS:

Precious metal has served as a pivotal resource throughout civilization. Safeguarding bullion stockpiles by monetary authorities is essential to uphold the present-day fiscal framework globally. Certain prominent corporations and financiers likewise allocate substantial capital towards this lustrous element. While challenging, forecasting the value of

this coveted metal would assist speculators and national treasuries in determining optimal moments for transactions, thereby amplifying their yields. The current methodology employs various computational learning techniques to accurately estimate aurum quotations. Consequently, our suggested approach enables the projection of forthcoming rates for this esteemed commodity

IV. PROPOSED SYSTEM

As a valuable commodity, the cost of aurum fluctuates based on market dynamics, akin to other merchandise. The suggested framework aims to examine the correlation between aurum's valuation and specific variables. A trio of artificial intelligence techniques—namely, straight-line forecasting, arbitrary arbor estimation, and incline amplification prediction—were employed to scrutinize aurum valuation statistics. Leveraging these computational methodologies enables prognostication of forthcoming transactions.

METHODOLOGY:

- **trainer**
- **cosmonaut**
- **admin**
- **artificial intelligence**

Trainer:

Astronaut preparation stands as a crucial aspect of the crewed spaceflight agenda. Instructing orbital outpost teams amid the shift towards cutting-edge computerized intelligent systems, machine-aided learning, and synthetic cognition is paramount. The regimen for team readiness encompasses strategizing, task coordination, and performance assessment. To fulfill the objectives of personnel instruction, it's essential to maximize the utilization of suitable assets. Programs are employed to retrieve simulations of critical incidents for forthcoming practice sessions. Crisis scenario drills are conducted. Identification of team miscalculations during the educational process is also emphasized.

Cosmonaut:

The escalating demands for rapid choices have necessitated the creation of digitally-aided management in the realm of astronaut education. The rising quantity of aerial maneuvers executed amplifies the intricacy of space traveler instruction. The advancement of physical resources and telecommunication apparatus further complicates matters. It is crucial to comprehend the aims, purposes, and roles of the comprehensive framework for team preparation, utilizing all-encompassing and specialized training devices.

Admin:

The objective of the administrator is to sanction instructors and space travelers. The complete

information should be collected for the overseer. Computerized supervision of astronaut preparation has emerged from the necessity to document substantial quantities of data (the tally of aerial maneuvers aboard the vessel surpasses several thousand) and to consider all elements influencing the organization and management of educational sessions. Utilizing this intelligence, the framework will enable the creation of supplementary examinations and assignments to enhance the acquisition of instructional materials.

Artificial intelligence

The implementation of cutting-edge electronic, intelligent innovations, automated mechanisms, novel substances and conceptual methodologies, establishment of extensive information processing frameworks, machine-assisted education and synthetic cognition are pertinent to numerous disciplines of research and innovation, encompassing crewed cosmic ventures. Several technological notions and experimental setups founded on artificial intellect (three-dimensional machine perception, mechanized arrangements for strategizing and assessing astronaut endeavors, inquiry and interchange platforms) were formulated within the sector across multiple eras.

ARCHITECTURE:

Figure 1: System Architecture

FLOW DIAGRAM:

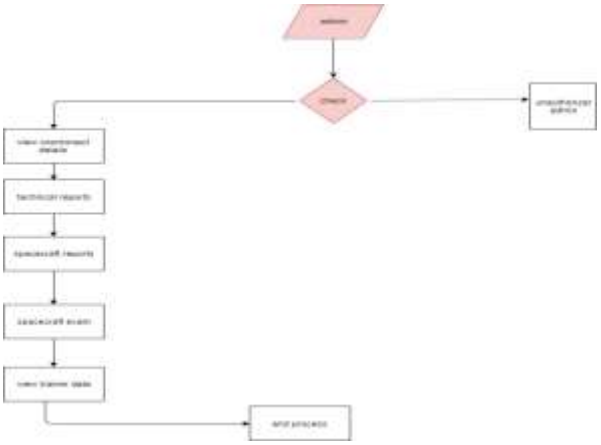
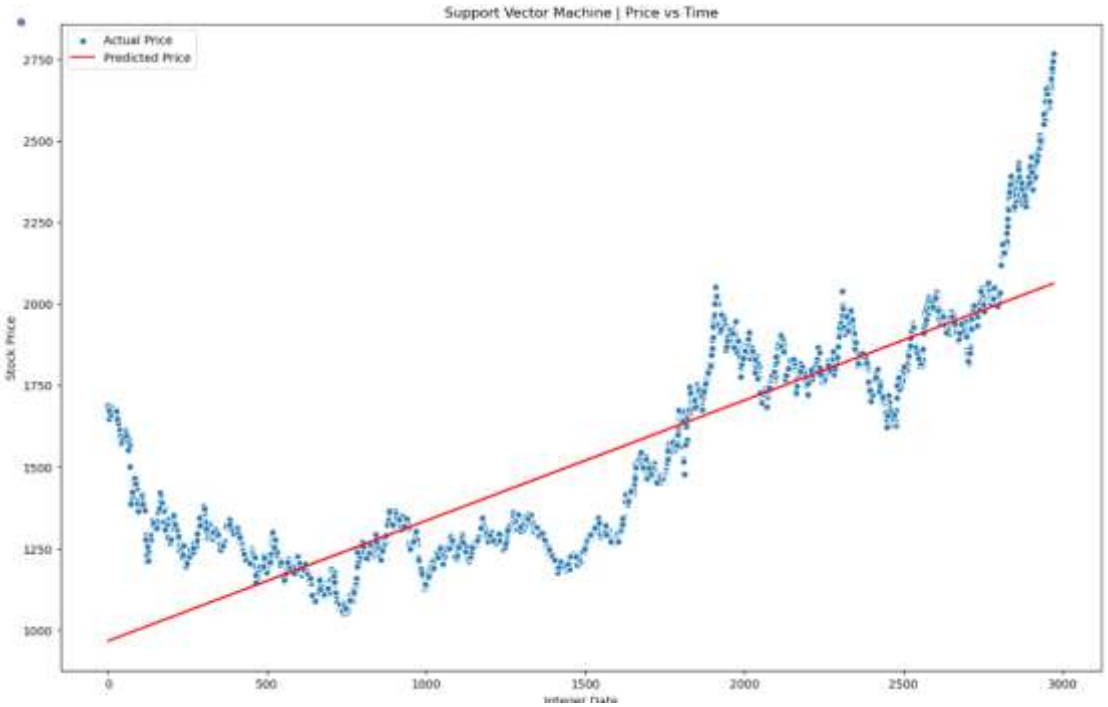
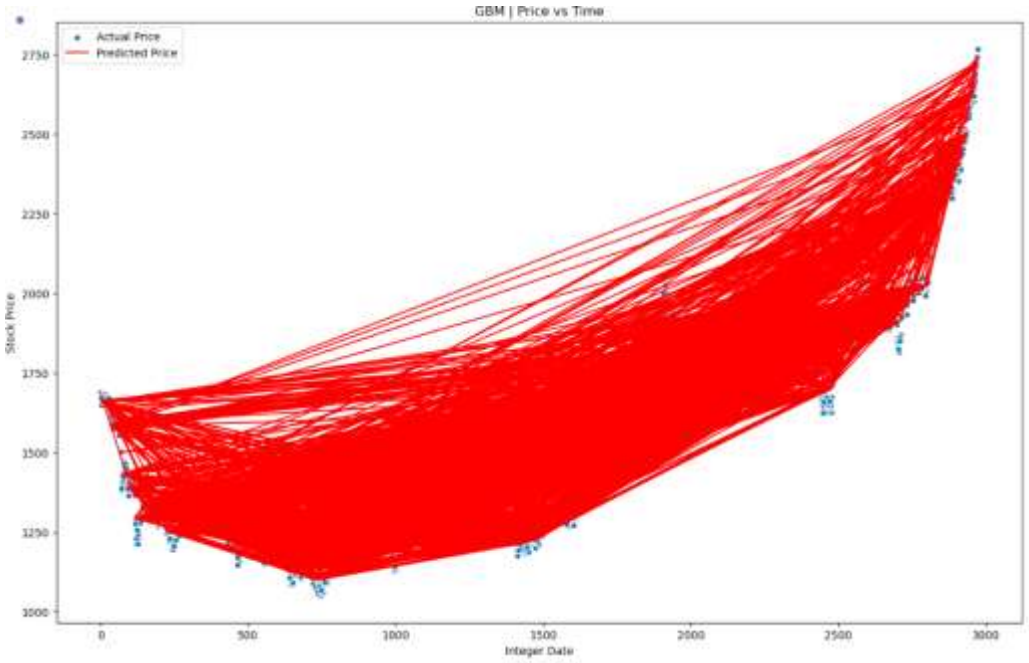


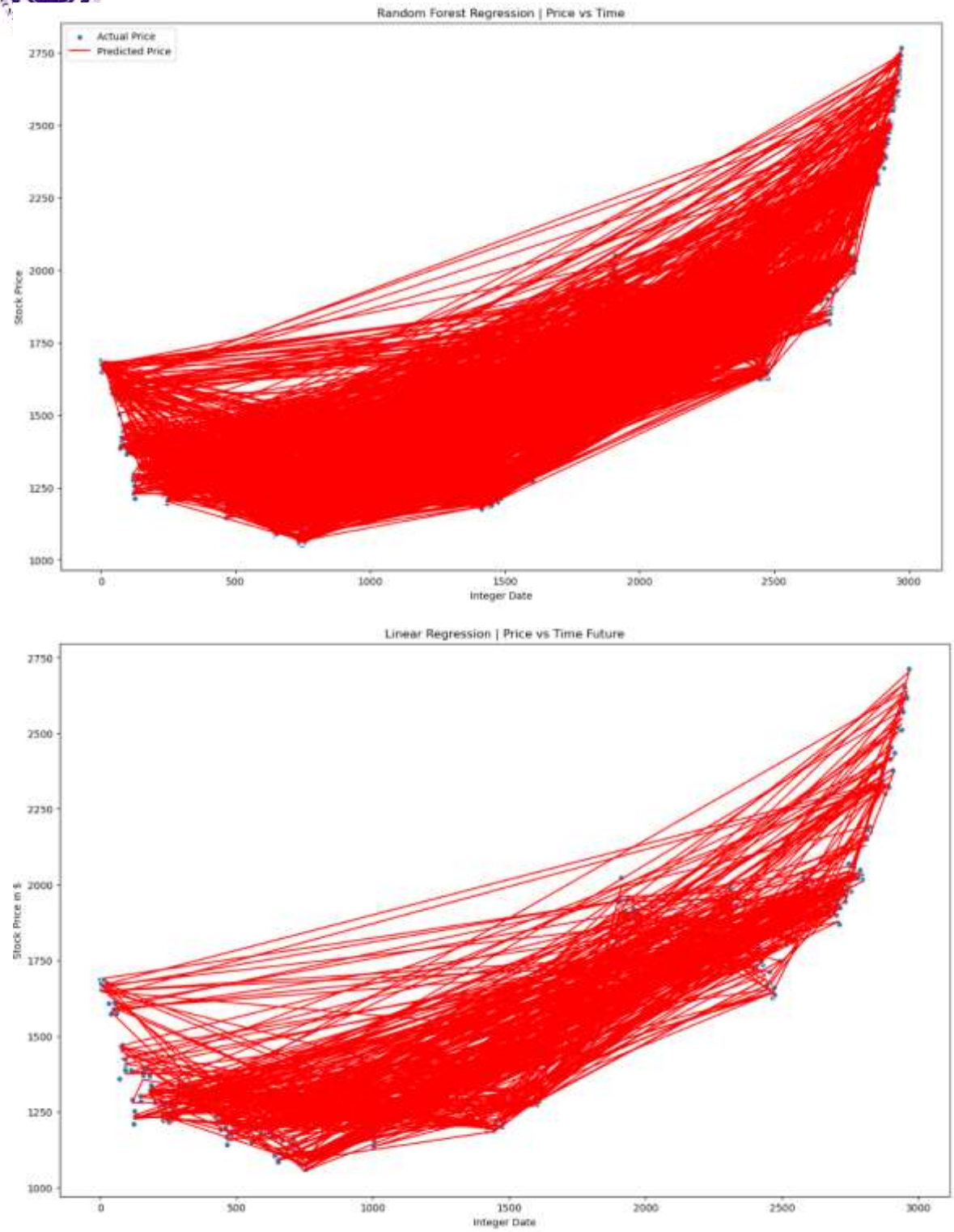
Figure 2: Model Flow Diagram

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 53, Issue 11, November : 2024

V. EVALUATION METRICS







Training the graph set for SVR LR,, GBM and RFR.

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 53, Issue 11, November : 2024

RESULTS:

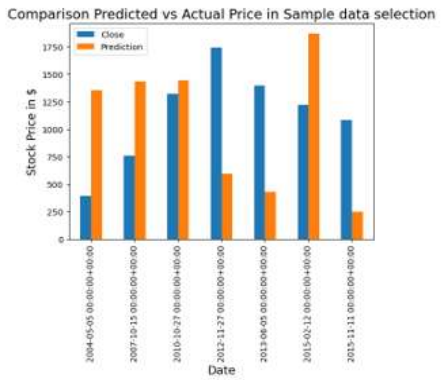
DATASET:

```
import yfinance as yf
import pandas as pd

data = yf.download("GC=F", start="2000-01-01", end="2024-11-14")
data.to_csv('Gold Future.csv')

[**********100%**********]  1 of 1 completed

data=pd.read_csv("Gold Future.csv")
print("The GTD dataset has {} samples with {} features.".format(*data.shape))

The GTD dataset has 6074 samples with 7 features.

data.head()
```

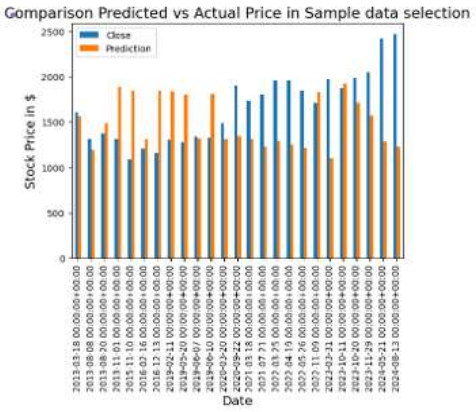
	Date	Adj Close	Close	High	Low	Open	Volume
0	2000-08-30 00:00:00+00:00	273.899994	273.899994	273.899994	273.899994	273.899994	0
1	2000-08-31 00:00:00+00:00	278.299988	278.299988	278.299988	274.799988	274.799988	0
2	2000-09-01 00:00:00+00:00	277.000000	277.000000	277.000000	277.000000	277.000000	0
3	2000-09-05 00:00:00+00:00	275.799988	275.799988	275.799988	275.799988	275.799988	2
4	2000-09-06 00:00:00+00:00	274.200012	274.200012	274.200012	274.200012	274.200012	0

Graphs Page:

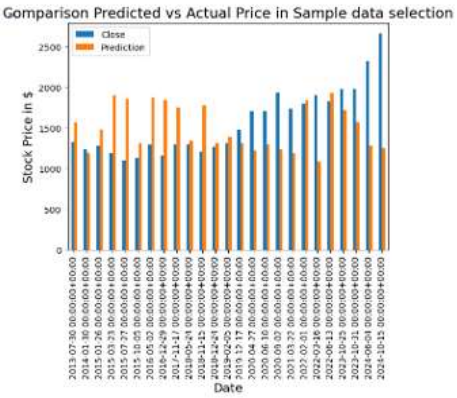
- SVR



- GBR



-- RFR



VI. CONCLUSION

This investigation aimed to examine the connection between bullion value and chosen

elements affecting its worth, specifically equity markets, petroleum costs, currency exchange rates, monetary devaluation, and lending rates. Monthly valuation statistics spanning January 2000 to December 2018 were utilized for the analysis. The information was subsequently divided into two timeframes: phase I from January 2000 to October 2011, during which the precious metal's price demonstrated an ascending pattern, and phase II from November 2011 to December 2018, where the commodity's value exhibited a lateral trend. Three artificial intelligence methodologies—linear modeling, random forest estimation, and gradient enhancement prediction—were employed in scrutinizing these figures. It was discovered that the interrelation among variables is robust during phase I and tenuous during phase II. While these frameworks display satisfactory alignment with data in phase I, the congruence is suboptimal during phase II. Random forest estimation is determined to possess superior forecasting precision for the entire duration, whereas gradient enhancement prediction yields enhanced accuracy for the two intervals considered separately. The conclusion drawn is that artificial intelligence methodologies prove highly beneficial in such examinations, yet the nature of the information influences their exactitude. Supplementary exploration employing comparable statistics and alternative techniques may be undertaken to gain deeper insights into the efficacy of these approaches.

.

VII. FUTURE SCOPE

The application of artificial intelligence techniques in financial market forecasting presents a promising path for boosting the precision and dependability of projections. Nevertheless, the existing framework can be broadened and honed in numerous aspects to further enhance its efficacy and relevance. Subsequent research might entail integrating supplementary information sources, such as public opinion from social platforms, fiscal indicators, and corporation-specific updates, to furnish a more all-encompassing backdrop for equity value fluctuations. Cutting-edge artificial intelligence methodologies like profound learning and collaborative models could be investigated to discern intricate patterns and correlations within the dataset. Furthermore, the system could be augmented with instantaneous information processing capabilities to deliver real-time prognostications. An additional crucial domain for forthcoming advancement is the employment of more sophisticated assessment criteria and historical simulation approaches to gauge the framework's effectiveness across diverse market scenarios. Lastly, merging the system into a straightforward interface with dynamic visualizations and judgment assistance instruments could substantially aid both retail and institutional investors in reaching well-informed trading conclusions.

VIII. REFERENCES

[1] W. Du and J. Schreger, “Local Currency Sovereign Risk,” Social Science Research Network, Rochester, NY, SSRN Scholarly Paper ID 2976788, Dec. 2013.

[2] J. Jagerson and S. W. Hansen, “All about investing in gold”, McGraw-Hill Publishing, 2011.

[3] Z. Ismail, A. Yahya, and A. Shabri, "Forecasting gold prices using multiple linear regression method," Am. J. Appl. Sci., vol. 6, no. 8, p. 1509, 2009.
[4] C. Toraman, Ç. Basarir, and M. F. Bayramoglu, "Determination of factors affecting the price of gold: A study of MGARCH model," Bus. Econ. Res. J., vol. 2, no.4, p. 37, 2011.
[5] C. Lawrence, "Why is gold different from other assets? An empirical investigation," Lond. UK World Gold Council., 2003.
[6] L. A. Sjaastad and F. Scacciavillani, "The price of gold and the exchange rate," J. Int. Money Finance, vol. 15, no.6, pp. 879–897, 1996.
[7] S. A. Baker and R. C. Van Tassel, "Forecasting the price of gold: A fundamentalist approach," Atl. Econ. J., vol. 13, no. 4, pp. 43–51, 1985.
[8] H. Naser, "Can Gold Investments Provide a Good Hedge Against Inflation? An Empirical Analysis," Int. J. Econ. Financ. Issues, vol. 7, no. 1, pp. 470–475, 2017.
[9] P. Khaemasunun, "Forecasting Thai gold prices," Available Http://www Wbiconpro Com3-Pravit. Pdf Acess, vol. 2, 2014.
[10] S. M. Hammoudeh, Y. Yuan, M. McAleer, and M. A. Thompson, "Precious metals–exchange rate volatility transmissions and hedging strategies," Int. Rev. Econ. Finance, vol. 19, no. 4, pp. 633–647, 2010.