International Journal of Asian Social Science
ISSN(e): 2224-4441/ISSN(p): 2226-5139
URL: www.aessweb.com

FORECASTING OF DAILY GOLD PRICE BY USING BOX-JENKINS METHODOLOGY

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ABSTRACT

All investors are very keen to know about the trend of the Gold price, whether it will rise or fall. In recent times, the price of Gold has become a hot topic for everyone, it fluctuates rapidly from last some months. In this study, we propose a time series model for forecasting the daily Gold price and use the data set of United State Dollars per ounce from Jan 02, 2014 to Jul 03, 2015 for the said purpose. By using the Box-Jenkins methodology, Autoregressive Integrated Moving Average (ARIMA) model is selected and the model selection criterion (AIC and SBC) shows that ARIMA (1,1,0) and (0,1,1) are close to each other for forecasting the daily Gold price. The forecasted values reveal that ARIMA (0,1,1) is more efficient than ARIMA (1,1,0) on the base of model selection criteria's, Mean Absolute Error (MAE), Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE).

Keywords: Gold price, ARIMA, MAE, MAPE, RMSE.

Contribution/ Originality

This study contributes in the existing literature related to forecasting of daily gold price. In this study, a methodology of statistical time series modelling is utilized known as Box-Jenkins. It is found that, model formulated by this methodology perform better than the other models presented in literature.

1. INTRODUCTION

One of the precious metals in the world is Gold. It is a major economic indicator along with oil, and United State Dollar. It is used extensively as an investment, jewelry, medicine, and in electronic industry. Gold is the only metal that maintain its ancient role of true standard value in all the circumstances. There are many ways that people can choose to invest their money. The two popular ways that people use are, putting money into savings accounts or investing in the form of the gold. Saving accounts have been around since the first bank was open, and gold has been a commodity that has been high in worth for thousands of years. The problem with a saving account is that when you put your money in accounts, it is not growing much. Although purchasing gold is also not going to give you an instantly high turn around price to sell it at, it is a steady investment that is going to grow gradually.

It is a constant measurement of value, you can take a gold price anywhere in the world and it have value. Gold is something you can safely store away knowing that it is something of great value that you can pass on to your children and your children's children. So, it is a legacy wealth. Along with other precious metals the saving of gold is the best

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DOI: 10.18488/journal.1/2016.6.11/1.11.614.624
ISSN(e): 2224-4441/ISSN(p): 2226-5139

way to achieve the objective of saving money by preserving both the value of your savings and protecting it from unwanted dangers. The central banks also buy and store gold, not silver, houses or oil for investment.

The world is a global village, where the rapid change in the economy may cause the changes in Gold price on every second. So, in this study, we can forecast it for the future planning. Further the whole article is organized as, in section 2, comprehensive review of recent past studies is done. Section 3 and 4 are about methodology and findings of the stated study respectively. Moreover, section 5 and 6 comprises on discussion and conclusion.

2. LITERATURE REVIEW

There are many debates and research works on the Gold Price and its forecasting. Some recent studies are discussed as; By using back-propagation neural networks along with genetic algorithms (Mirmirani and Li, 2004) found that the Gold price movement depends on the short time period. Ismail *et al.* (2009) developed a forecasting study about the Gold price by utilizing MLR (Multiple Linear Regression) method. Different indicators such as; CRB (Commodity Research Bureau future index), IR (Inflation Rate), EUROUSD (USD/Euro Foreign Exchange Rate), MI (Money Supply), NYSE (New York Stock Exchange), SPX (Standard and Poor 500), T-BILL (Treasury Bill) and USDX (US Dollar index) are used to developed the models. Step-wise regression is utilized to remove the multicollinearity and Prais-Winsten procedure is used to solve the issue about correlated error terms. Mean Square Error was used for the measure of forecasting accuracy and the findings revealed that MI, CRB, IR, and EUROUSD are the significant variable in the model. Khaemasunun (2009) made a case study about the Thai Gold prices and utilized multiple regression method and ARIMA model for the forecasting. The result showed that ARIMA (1, 1, 1) is best model for the forecasting of Thai Gold price. Lineesh *et al.* (2010) used four different techniques such as; generalized autoregressive conditional heterockedasticity (GARCH) model, Wavelet Neural Network, Trend and Threshold Autoregressive model, and Wavelet Neural Network with Trend and Threshold Autoregressive model for the forecasting of the Gold price. The data set of the Gold price from Jan 1990 to Dec 2009 was used for estimation purpose and by using the error comparison, Wavelet Neural Network and Wavelet Neural Network with Trend and Threshold Autoregressive model outperforms all other methods under study. For the large samples, Wavelet Neural Network is more efficient and in small samples, Wavelet Neural Network with Trend and Threshold Autoregressive model is good to forecast the Gold price. Shafiee and Topal (2010) proposed a trend stationary model and used two important variables (Inflation and Oil Price) to forecast the Gold price for the next 10 years. Results showed that price of the Gold will increase abnormally up to the end of 2014. Sujit and Kumar (2011) considered the Gold price, stock returns, exchange rate, and oil price to compute vector autoregressive model as well as cointegration. Finding depicts the relationship between these variables and conclude that the exchange rate of United State Dollar directly affects the Gold price. Yuan (2012) used projection pursuit algorithm to find out important nonlinear variables and build a Backpropagation (BP) neural network for forecasting the Gold price. By using genetic algorithm and the simulated results the optimize BP neural network was declared as most efficient model under study. Massarrat (2013) carried out a study about forecasting the Gold price for the London Gold market (daily price in United State Dollars per ounce) from Jan 2003 to Jan 2012. Box-Jenkins methodology was used for the selection of an appropriate model and ARIMA (0,1,1) was declared as efficient model on the base of accuracy measures (MAE, MAPE, and RMSE). Davis *et al.* (2014) developed a case study about the modeling and forecasting of the Gold price in the financial market. The monthly adjusted close price of the Gold from Jan 2003 to Apr 2012 were used for constructing the ARIMA model and revealed that all actual values were lying between the forecasted limits. Nadeem *et al.* (2014) utilized generalized method of moments (GMM) to check the effect of inflation stock price, international Gold price, rupees per Dollar exchange rate, income on the domestic Gold price and international oil price on the price of Gold in Pakistan. Estimation showed that inflation rate, international Gold price, international oil price and income on the domestic Gold price has a positive effect while others have a negative effect on the price of Gold in Pakistan. Baber *et al.* (2015) computed the correlation analysis and revealed that international business, politics, market condition,

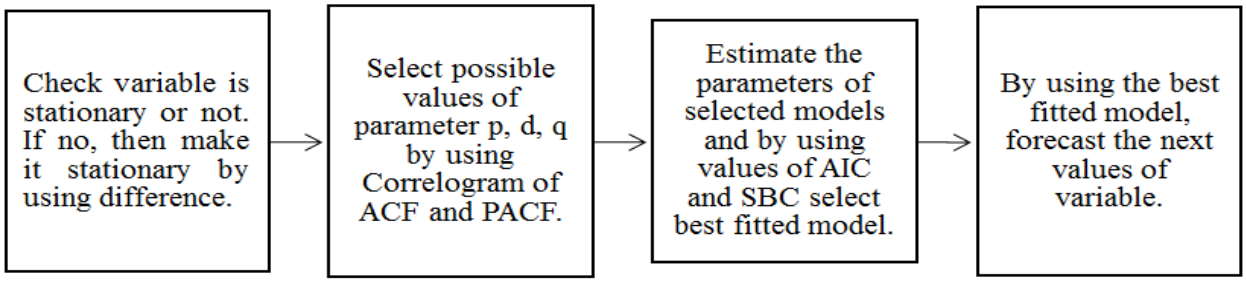
induction in the commodity market, buying behavior of the consumer, and inflation are the significant factors for the Gold price.

After a comprehensive review of different studies, we reached at the point that daily price of Gold has a major role in the investment. So everyone wants to know its future value for maximizing his profit. Therefore, different techniques used for this purpose mentioned above but still there is a mystery to know that what happened in the future either it rises or fall. In previous studies, forecasting checks are mostly ignored but in this study, we are not only forecasting the daily Gold Price but also discussing the accuracy of it by using MAE, MAPE, and RMSE.

The objective of this study is to propose a time series model for forecasting the daily Gold price. (USA GOLD, n.d.) For the said study, data set of the Gold price between Jan 02, 2014 to Jul 03, 2015 is taken from USA GOLD Website (daily price in United State Dollars per ounce) given in Table 4.

3. METHODOLOGY

A mystery to know, what happened in the future, either the index rises or fall, a forecasting methodology was proposed by Box and Jenkins in 1970 named as Box-Jenkins methodology (Forecast, P.R.O., n.d.). It is most appropriate model selection method for forecasting of time series variable. The Box-Jenkins methodology is applicable only when the variable fulfills some assumptions. First of all, variable should be stationary and there is no seasonality, but if the variable violated the assumption or any pattern according to scale or location then the first task is to make it stationary for applying Box-Jenkins model. Practice shows that most variables are non-stationary in real life so to convert non-stationary variables into stationary variables we take the difference of variables and the new variables are known as integrated variable. The Box-Jenkins methodology may be followed by this way:



Step 1: For testing the null hypothesis "data is not stationarity", we use Augmented Dickey Fuller (ADF) test. If the significant value of ADF test is less than desired level of significance which is mostly 0.05, we conclude that data is stationary. Step 2: The linear relationship between two values of the same variable is terms as autocorrelation (ACF). If we calculate ACF after removing any linear dependency from the lag values, it will have called partial autocorrelation (PACF). ACF and PACF both ranges from -1 to +1. The graphical representation of ACF and PACF is called Correlogram. In the correlogram ACF show the order of autoregressive model (p) and PACF show the order of moving average model (q). Step 3: Akaike in 1974 developed akaike information criterion (AIC) in his publication (Wikipedia, n.d.). In 1978, Schwarz developed schwarz Bayesian criterion in his paper (Wikipedia, n.d.). By using these two methods, best model is selected in Box-Jenkins approach. Step 4: By using the best fitted model, the daily gold price for next days are forecast.

4. RESULTS

For the forecasting purpose, data is taken from the site of USA GOLD and it consist of the daily price in United State Dollars per ounce from Jan 02, 2014 to Jul 03, 2015.

4.1. Stationary Test

When the variable is going without any change in its mean and variation for a long time, it said to be stationary. For utilizing Box-Jenkins methodology, variable must be stationary. In literature, many graphical and empirical methods available to check stationary. In this study, both graphical and empirical methods have been utilized for the said purpose. In graphical methods, Line Diagram and Correlogram have been utilized. Figure 1 shows the Line Diagram of the daily Gold price from Jan 02, 2014 to Jul 03, 2015. And Figure 2shows Correlogram of the daily Gold price.

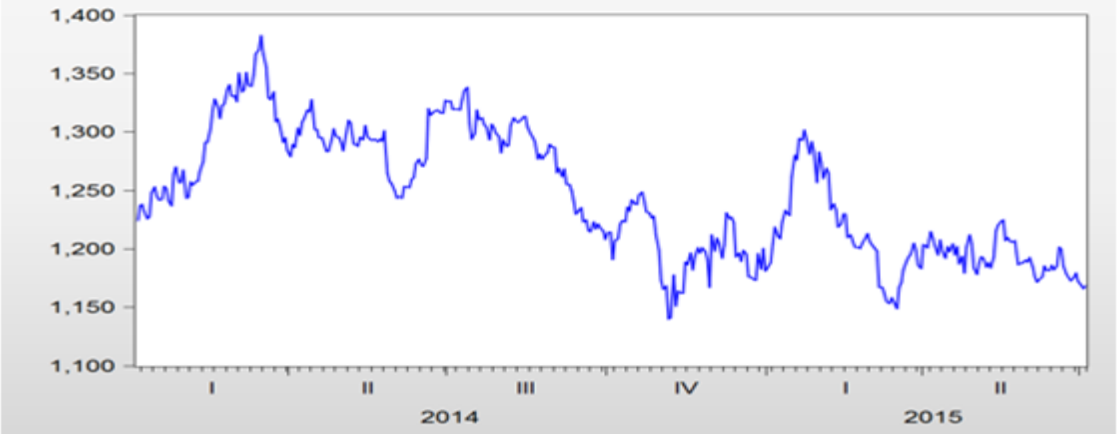
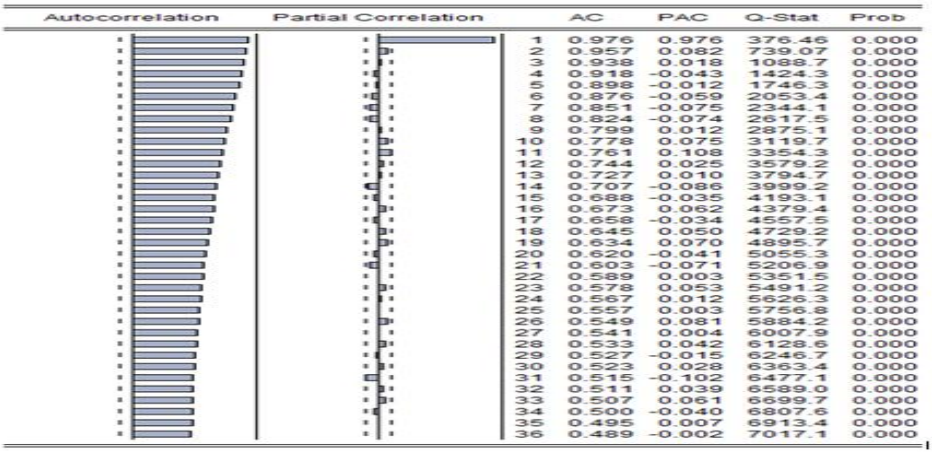


Figure-1. Daily Price of Gold

Figure 1 shows time on x-axis and daily price on y axis. The pattern reveals that there are many ups and downs in the Gold price. Long term decreasing pattern of daily price indicates that it is non stationary.



	AC	PAC	Q-Stat	Prob
1	0.976	0.976	376.46	0.000
2	0.957	0.082	739.07	0.000
3	0.938	0.018	1088.7	0.000
4	0.918	-0.043	1424.3	0.000
5	0.898	-0.012	1746.3	0.000
6	0.876	-0.059	2053.4	0.000
7	0.851	-0.075	2344.1	0.000
8	0.824	-0.074	2617.5	0.000
9	0.799	0.012	2875.1	0.000
10	0.778	0.075	3119.7	0.000
11	0.761	0.108	3354.3	0.000
12	0.744	0.025	3579.2	0.000
13	0.727	0.010	3794.7	0.000
14	0.707	-0.086	3999.2	0.000
15	0.688	-0.035	4193.1	0.000
16	0.673	0.062	4379.4	0.000
17	0.658	-0.034	4557.5	0.000
18	0.645	0.050	4729.2	0.000
19	0.634	0.070	4895.7	0.000
20	0.620	-0.041	5055.3	0.000
21	0.603	-0.071	5206.9	0.000
22	0.589	0.003	5351.5	0.000
23	0.578	0.053	5491.2	0.000
24	0.567	0.012	5626.3	0.000
25	0.557	0.003	5756.8	0.000
26	0.549	0.081	5884.2	0.000
27	0.541	0.004	6007.9	0.000
28	0.533	0.042	6128.6	0.000
29	0.527	-0.015	6246.7	0.000
30	0.523	0.028	6363.4	0.000
31	0.515	-0.102	6477.1	0.000
32	0.511	0.039	6589.0	0.000
33	0.507	0.061	6699.7	0.000
34	0.500	-0.040	6807.6	0.000
35	0.495	0.007	6913.4	0.000
36	0.489	-0.002	7017.1	0.000

Figure-2. Correlogram for Daily Price of Gold

In Figure 2, Correlogram of autocorrelation and partial correlation shows that there is high correlation between the values, but with the passage of time it decreases but still shows significant autocorrelation at lag 36.

In empirical methods, ADF (Augmented-Dickey Fuller) test has been utilized. On the basis of its P-value 0.3820 we don't reject our H_0 at the 5 % level of significance and conclude that the daily Gold price is Non-Stationary variable. In this study, differenced technique is utilized to make variable stationary. Line Diagram, Correlogram and ADF test have been utilized again after taking 1st difference of variable.

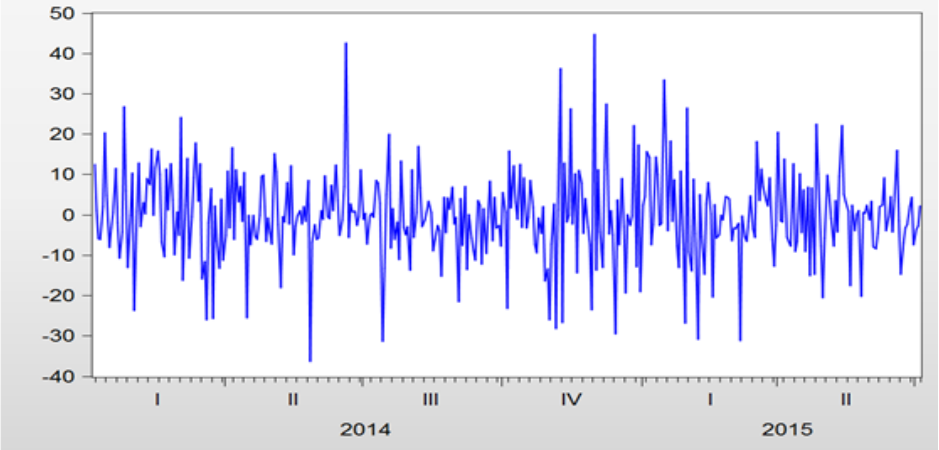
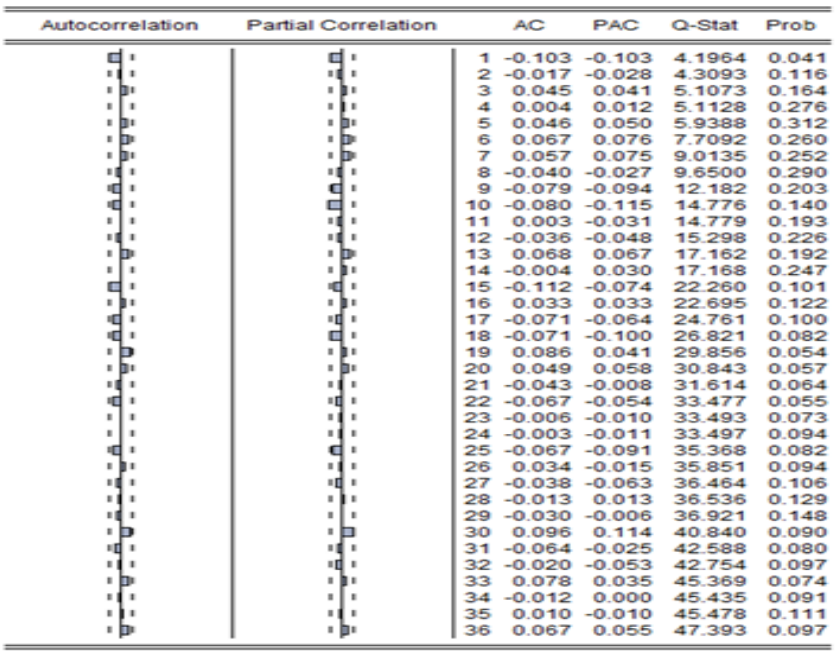


Figure-3. Line Diagram of Daily Gold Price at 1st Difference

Line Diagram of the daily price of Gold by using the 1st difference is shown in Figure 3.It indicates that there is no change in mean price and has constant variation throughout the time period. So, we may say that series is stationary at 1st difference.



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.103	-0.103	4.1964	0.041
		2	-0.017	-0.028	4.3093	0.116
		3	0.045	0.041	5.1073	0.164
		4	0.004	0.012	5.1128	0.276
		5	0.046	0.050	5.9388	0.312
		6	0.067	0.076	7.7092	0.260
		7	0.057	0.075	9.0135	0.252
		8	-0.040	-0.027	9.6500	0.290
		9	-0.079	-0.094	12.182	0.203
		10	-0.080	-0.115	14.776	0.140
		11	0.003	-0.031	14.779	0.193
		12	-0.036	-0.048	15.298	0.226
		13	0.068	0.067	17.162	0.192
		14	-0.004	0.030	17.168	0.247
		15	-0.112	-0.074	22.260	0.101
		16	0.033	0.033	22.695	0.122
		17	-0.071	-0.064	24.761	0.100
		18	-0.071	-0.100	26.821	0.082
		19	0.086	0.041	29.856	0.054
		20	0.049	0.058	30.843	0.057
		21	-0.043	-0.008	31.614	0.064
		22	-0.067	-0.054	33.477	0.055
		23	-0.006	-0.010	33.493	0.073
		24	-0.003	-0.011	33.497	0.094
		25	-0.067	-0.091	35.368	0.082
		26	0.034	-0.015	35.851	0.094
		27	-0.038	-0.063	36.464	0.106
		28	-0.013	0.013	36.536	0.129
		29	-0.030	-0.006	36.921	0.148
		30	0.096	0.114	40.840	0.090
		31	-0.064	-0.025	42.588	0.080
		32	-0.020	-0.053	42.754	0.097
		33	0.078	0.035	45.369	0.074
		34	-0.012	0.000	45.435	0.091
		35	0.010	-0.010	45.478	0.111
		36	0.067	0.055	47.393	0.097

Figure-4. Correlogram of Daily Gold Price at 1st Difference

Correlogram of the daily price of Gold by using the 1st difference is shown above. It clearly shows that all spikes are random and very small in magnitude, so, our data is stationary.

When we apply ADF test on 1st difference data it shows 0 P-value. So we don't reject our H_0 at the 5 % level of significance and conclude that our data is stationary at the 1st difference.

4.2. Model Identification and Parameter Estimation

After making data stationary we select ARIMA model with d=1, and the values of q and p are selected on the basis of ACF and PACF. We estimate the model of different q and p by using E-views and find the values of SBC and AIC given in Table 1. By comparing these two values we select ARIMA (1,1,0) as a best fitted model because the values of its SBC and AIC are least from all other estimated models.

Table-1. AIC and SBC of Different ARIMA Models

Model (P, d, q)	AIC	SBC
0,1,1	7.676237**	7.697349**
0,1,2	7.688176	7.709287
0,1,3	7.686188	7.707299
1,1,0	7.675839*	7.696993*
2,1,0	7.690152	7.711349
3,1,0	7.689941	7.711180
1,1,1	7.680887	7.712618
1,1,2	7.680988	7.712719
1,1,3	7.678957	7.710688
2,1,1	7.683586	7.715381
2,1,2	7.684590	7.716385
2,1,3	7.693369	7.725164
3,1,1	7.682972	7.714832
3,1,2	7.695340	7.727199
3,1,3	7.693012	7.724871

** Second lowest value of AIC and SBC
*lowest value of AIC and SBC

4.3. Forecasting Accuracy

For forecasting purposes ARIMA (0,1,1) and ARIMA (1,1,0) models are used.

$$\widehat{D(GP)} = C + \alpha\, AR(p) + \beta MA(q) + u_i$$

Where $\widehat{D(GP)}$ is 1st differenced series of the daily gold price, C is an intercept, α is coefficient of autoregressive lag values AR(p), β is coefficient of moving average lag values MA(q) and μ shows the residuals of model. In Box-Jenkins model residuals should be independently identically normally distributed.

In ARIMA (1,1,0) we use AR (1) model so its estimated equation is

$$\widehat{D(GP)} = -0.170982 - 0.107844\ \mathrm{AR}(1)$$

In ARIMA (0,1,1) we use MA (1) model so its estimated equation is

$$\widehat{D(GP)} = -0.143746 - 0.110524\ \mathrm{MA}(1)$$

For measuring the accuracy of these two models we use MAE, MAPE and RMSE.

Table-2. Forecasting Checks

	ARIMA (1,1,0)	ARIMA (0,1,1)
RMSE	12.81892	12.52944
MAE	9.791873	9.542815
MAPE	0.824708	0.803816

Table 2 shows that MAE, MAPE, and RMSE of ARIMA (0,1,1) model are less than ARIMA (1,1,0) model. So, there is less error in forecast values of ARIMA (0,1,1) than ARIMA (1,1,0).

4.4. Analysis of Forecast Results

The daily price of Gold from Jan 02, 2014 until Jun 05, 2015 are used for forecasting the next 20 values of the daily price of Gold by using both ARIMA (0,1,1) and ARIMA (1,1,0) models. The forecasted results are following:

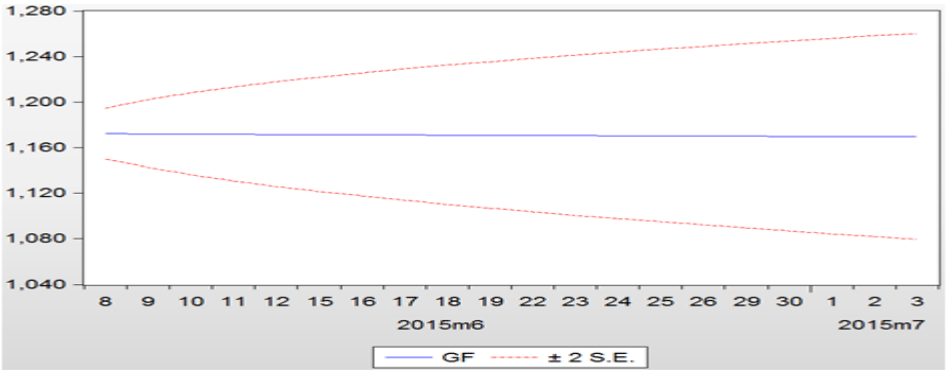


Figure-5. Forecast ARIMA (1,1,0)

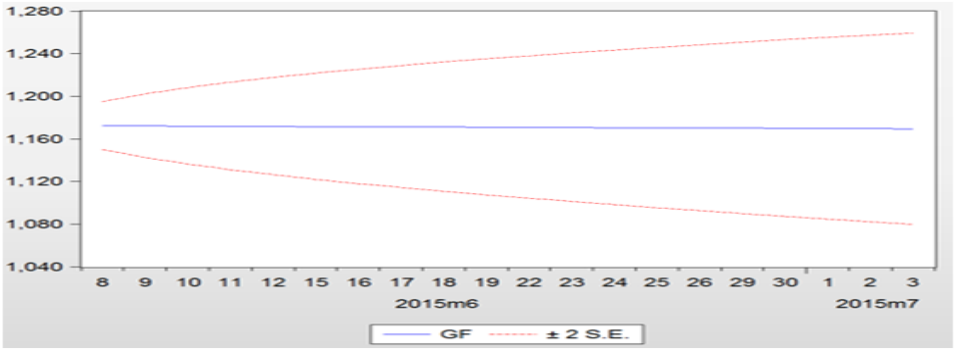


Figure-6. Forecast ARIMA (0,1,1)

Figure 5 and 6 shows the forecast of ARIMA (1,1,0) and ARIMA (0,1,1) with 2 S.E. In the above figures days are taken on x-axis and price of the Gold on y axis. it clearly indicates that Forecast of ARIMA (0,1,1) are better than ARIMA (1,1,0) due to less MAE, MAPE, and RMSE.

Table-3. Error Comparison of ARIMA (0,1,1) and ARIMA (1,1,0)

Date	Actual values	Forecasted ARIMA (0,1,1)	Error	Forecasted ARIMA (1,1,0)	Error
8th Jun 2015	1173.96	1172.26	-1.70	1172.10	-1.86
9th Jun 2015	1176.38	1172.11	-4.27	1171.88	-4.50
10th Jun 2015	1185.68	1171.97	-13.71	1171.72	-13.96
11th Jun 2015	1181.86	1171.82	-10.04	1171.54	-10.32
12th Jun 2015	1181.50	1171.68	-9.82	1171.37	-10.13
15th Jun 2015	1186.07	1171.54	-14.53	1171.20	-14.87
16th Jun 2015	1181.93	1171.39	-10.54	1171.03	-10.90
17th Jun 2015	1185.46	1171.25	-14.21	1170.86	-14.60
18th Jun 2015	1201.43	1171.11	-30.32	1170.69	-30.74
19th Jun 2015	1200.06	1170.96	-29.10	1170.52	-29.54
22nd Jun 2015	1185.42	1170.82	-14.60	1170.35	-15.07
23rd Jun 2015	1178.53	1170.67	-7.86	1170.18	-8.35
24th Jun 2015	1175.33	1170.53	-4.80	1170.01	-5.32
25th Jun 2015	1172.98	1170.39	-2.59	1169.83	-3.15
26th Jun 2015	1175.28	1170.24	-5.04	1169.66	-5.62
29th Jun 2015	1179.69	1170.10	-9.59	1169.49	-10.20
30th Jun 2015	1172.24	1169.96	-2.28	1169.32	-2.92
1st Jul 2015	1168.75	1169.81	1.06	1169.15	0.40
2nd Jul 2015	1166.06	1169.67	3.61	1168.98	2.92
3rd Jul 2015	1168.33	1169.52	1.19	1168.81	0.48

Table 3 shows that there is less error in ARIMA (0,1,1) as compare to ARIMA (1,1,0).
Figure 7 shows the relation of actual and forecasted values of ARIMA (0,1,1).

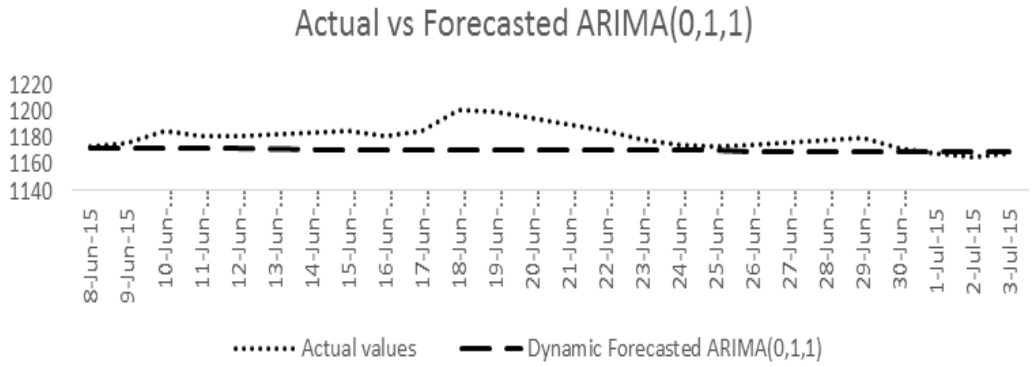


Figure-7. Actual vs Forecasted ARIMA (0,1,1)

4.5. Residuals Analysis

In Box-Jenkins methodology, residuals of best fitted model must be independently identically normally distributed (IID). For justifying this assumption, Histogram and Correlogram have been utilized.

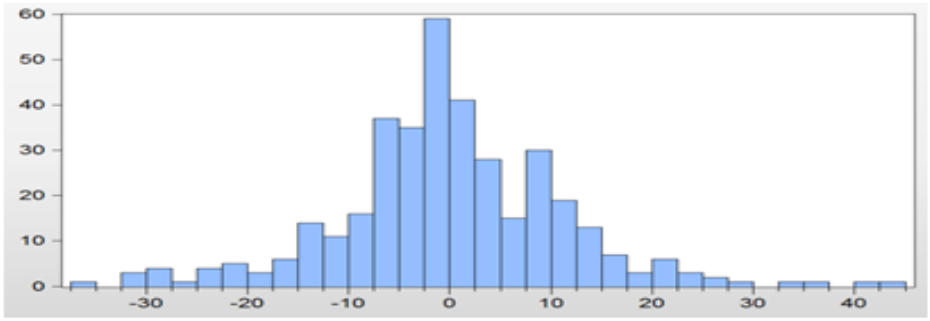
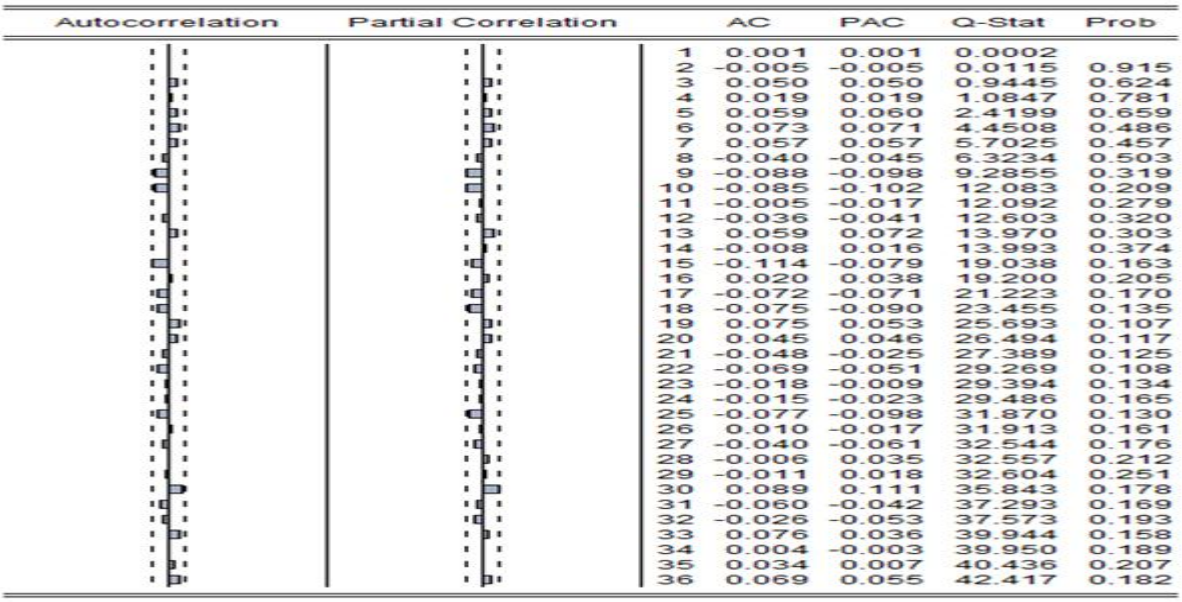


Figure-8. Histogram of residuals of ARIMA (0,1,1)

The histogram shows that residuals of ARIMA (0,1,1) are normally distributed as the bars showing a symmetrical pattern.



Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.001	0.001	0.0002	
		2	-0.005	-0.005	0.0115	0.915
		3	0.050	0.050	0.9445	0.624
		4	0.019	0.019	1.0847	0.781
		5	0.059	0.060	2.4199	0.659
		6	0.073	0.071	4.4508	0.486
		7	0.057	0.057	5.7025	0.457
		8	-0.040	-0.045	6.3234	0.503
		9	-0.088	-0.098	9.2855	0.319
		10	-0.085	-0.102	12.083	0.209
		11	-0.005	-0.017	12.092	0.279
		12	-0.036	-0.041	12.603	0.320
		13	0.059	0.072	13.970	0.303
		14	-0.008	0.016	13.993	0.374
		15	-0.114	-0.079	19.038	0.163
		16	0.020	0.038	19.200	0.205
		17	-0.072	-0.071	21.223	0.170
		18	-0.075	-0.090	23.455	0.135
		19	0.075	0.053	25.693	0.107
		20	0.045	0.046	26.494	0.117
		21	-0.048	-0.025	27.389	0.125
		22	-0.069	-0.051	29.269	0.108
		23	-0.018	-0.009	29.394	0.134
		24	-0.015	-0.023	29.486	0.165
		25	-0.077	-0.098	31.870	0.130
		26	0.010	-0.017	31.913	0.161
		27	-0.040	-0.061	32.544	0.176
		28	-0.006	0.035	32.557	0.212
		29	-0.011	0.018	32.604	0.251
		30	0.089	0.111	35.843	0.178
		31	-0.060	-0.042	37.293	0.169
		32	-0.026	-0.053	37.573	0.193
		33	0.076	0.036	39.944	0.158
		34	0.004	-0.003	39.950	0.189
		35	0.034	0.007	40.436	0.207
		36	0.069	0.055	42.417	0.182

Figure-9. Correlogram of residuals of ARIMA (0,1,1)

Correlogram of residuals indicates that they are stationary in nature and have no pattern. So, Histogram and Correlogram tells that the selected model ARIMA (0,1,1) is best for the forecasting purpose of daily Gold price.

5. DISCUSSION

For forecasting of daily Gold price correlation analysis, GMM technique, multivariate model are not sufficient techniques as used in (Baber *et al.* (2015); Nadeem *et al.* (2014)). So in this study, we moved towards such a technique who really solve our problem. In this study, Box-Jenkins ARIMA model is used because it is best forecasting technique when we have time series data and by using AIC and SBC values of different possible ARIMA models, two models ARIMA (1,1,0) and ARIMA (0,1,1) are selected. Unlike the (Davis *et al.* (2014); Khaemasunun (2009); Mirmirani and Li (2004)) we check the accuracy of forecasting results of both ARIMA (1,1,0) and ARIMA (0,1,1) by using MAE, MAPE, and RMSE. The results of all forecasting checks indicates that ARIMA (0,1,1) (9.542815, 0.803816, 12.52944) is more efficient than ARIMA (1,1,0) (9.791873, 0.824708, 12.81892) as well as the model in Massarrat (2013) having (18.78972, 1.082841, 22.38152). Figure 7 also shows that actual and forecasted values of daily Gold price by using ARIMA (0,1,1) are very close to each other.

6. CONCLUSION

In this study, a univariate time series model is selected by using the data of the daily Gold price from USA GOLD Web site. We apply Box-Jenkins methodology for forecasting the daily Gold price. By using the Line Diagram, Correlogram and ADF Test we found that our data is stationary at the 1st difference. After the estimation of models, and by comparing their AIC and SBC we conclude that ARIMA (0,1,1) and (1,1,0) are very close to each other so we use both models for forecasting purposes. After forecasting the values, we check the accuracy by using MAE, MAPE, and RMSE. From the above study, it is found that ARIMA (0,1,1) is more efficient than ARIMA (1,1,0).

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Table-4. Daily Gold Price from January 2, 2014 to June 5, 2015

Date	Gold Price	Date	Gold Price	Date	Gold Price	Date	Gold Price	Date	Gold Price	Date	Gold Price	Date	Gold Price
2-Jan-14	1224.18	21-Mar-14	1334.28	9-Jun-14	1252.26	26-Aug-14	1280.98	12-Nov-14	1162.36	29-Jan-15	1256.7	17-Apr-15	1204.14
3-Jan-14	1236.73	24-Mar-14	1308.68	10-Jun-14	1259.74	27-Aug-14	1282.49	13-Nov-14	1162.28	30-Jan-15	1283.2	20-Apr-15	1195.04
6-Jan-14	1237.86	25-Mar-14	1310.96	11-Jun-14	1260.92	28-Aug-14	1289.44	14-Nov-14	1188.66	2-Feb-15	1274.04	21-Apr-15	1202.02
7-Jan-14	1231.92	26-Mar-14	1304.37	12-Jun-14	1273.24	29-Aug-14	1287.19	17-Nov-14	1186.48	3-Feb-15	1260.25	22-Apr-15	1187.08
8-Jan-14	1225.82	27-Mar-14	1291.22	13-Jun-14	1276.75	1-Sep-14	1286.7	18-Nov-14	1196.71	4-Feb-15	1269.14	23-Apr-15	1193.8
9-Jan-14	1227.84	28-Mar-14	1295.19	16-Jun-14	1271.77	2-Sep-14	1265.27	19-Nov-14	1182.29	5-Feb-15	1264.55	24-Apr-15	1179.19
10-Jan-14	1248.12	31-Mar-14	1283.96	17-Jun-14	1270.59	3-Sep-14	1269.28	20-Nov-14	1193.43	6-Feb-15	1233.78	27-Apr-15	1201.76
13-Jan-14	1253.02	1-Apr-14	1278.88	18-Jun-14	1277.59	4-Sep-14	1261.78	21-Nov-14	1201.29	9-Feb-15	1238.91	28-Apr-15	1211.97
14-Jan-14	1245.05	2-Apr-14	1289.81	19-Jun-14	1320.17	5-Sep-14	1268.8	24-Nov-14	1196.71	10-Feb-15	1233.58	29-Apr-15	1204.33
15-Jan-14	1241.75	3-Apr-14	1286.56	20-Jun-14	1314.55	8-Sep-14	1255.22	25-Nov-14	1200.77	11-Feb-15	1218.94	30-Apr-15	1183.84
16-Jan-14	1242.27	4-Apr-14	1303.28	23-Jun-14	1317.35	9-Sep-14	1255.33	26-Nov-14	1197.78	12-Feb-15	1221.64	1-May-15	1178.19
17-Jan-14	1253.84	7-Apr-14	1297.26	24-Jun-14	1318.13	10-Sep-14	1249.65	27-Nov-14	1190.4	13-Feb-15	1229.66	4-May-15	1188.11
20-Jan-14	1252.01	8-Apr-14	1308.53	25-Jun-14	1319.12	11-Sep-14	1240.8	28-Nov-14	1166.99	16-Feb-15	1230	5-May-15	1193.05
21-Jan-14	1241.28	9-Apr-14	1311.72	26-Jun-14	1316.49	12-Sep-14	1229.57	1-Dec-14	1211.81	17-Feb-15	1209.6	6-May-15	1192.13
22-Jan-14	1237.08	10-Apr-14	1318.85	27-Jun-14	1316.02	15-Sep-14	1233.13	2-Dec-14	1198.16	18-Feb-15	1212.27	7-May-15	1184.39
23-Jan-14	1263.89	11-Apr-14	1317.21	30-Jun-14	1327.23	16-Sep-14	1235.48	3-Dec-14	1209.36	19-Feb-15	1206.59	8-May-15	1188.04
24-Jan-14	1269.94	14-Apr-14	1327.84	1-Jul-14	1326.25	17-Sep-14	1223.35	4-Dec-14	1205.16	20-Feb-15	1201.77	11-May-15	1183.86
27-Jan-14	1256.94	15-Apr-14	1302.45	2-Jul-14	1326.72	18-Sep-14	1224.93	5-Dec-14	1192.08	23-Feb-15	1201.66	12-May-15	1193.36
28-Jan-14	1256.82	16-Apr-14	1302.39	3-Jul-14	1319.46	19-Sep-14	1215.48	8-Dec-14	1203.33	24-Feb-15	1200.36	13-May-15	1215.5
29-Jan-14	1267.19	17-Apr-14	1295.05	4-Jul-14	1319.3	22-Sep-14	1214.95	9-Dec-14	1230.84	25-Feb-15	1204.87	14-May-15	1220.59
30-Jan-14	1243.56	18-Apr-14	1294.97	7-Jul-14	1319.73	23-Sep-14	1223.28	10-Dec-14	1226.17	26-Feb-15	1209.32	15-May-15	1223.86
31-Jan-14	1244.41	21-Apr-14	1289.68	8-Jul-14	1319.13	24-Sep-14	1216.96	11-Dec-14	1227.29	27-Feb-15	1213.16	18-May-15	1224.85
3-Feb-14	1257.37	22-Apr-14	1283.64	9-Jul-14	1327.7	25-Sep-14	1221.43	12-Dec-14	1222.44	2-Mar-15	1206.72	19-May-15	1207.28
4-Feb-14	1254.56	23-Apr-14	1283.65	10-Jul-14	1335.6	26-Sep-14	1218.2	15-Dec-14	1193	3-Mar-15	1203.57	20-May-15	1209.67
5-Feb-14	1257.71	24-Apr-14	1293.18	11-Jul-14	1338.45	29-Sep-14	1215.67	16-Dec-14	1196.77	4-Mar-15	1200.22	21-May-15	1205.82
6-Feb-14	1258.04	25-Apr-14	1303	14-Jul-14	1307.11	30-Sep-14	1208.04	17-Dec-14	1189.48	5-Mar-15	1198.24	22-May-15	1205.96
7-Feb-14	1267.15	28-Apr-14	1296.49	15-Jul-14	1293.89	1-Oct-14	1213.7	18-Dec-14	1198.55	6-Mar-15	1167.16	25-May-15	1207.02
10-Feb-14	1274.74	29-Apr-14	1295.82	16-Jul-14	1299.05	2-Oct-14	1214.43	19-Dec-14	1195.6	9-Mar-15	1167.01	26-May-15	1186.87
11-Feb-14	1291.05	30-Apr-14	1291.5	17-Jul-14	1319.04	3-Oct-14	1191.24	22-Dec-14	1176.22	10-Mar-15	1161.69	27-May-15	1187.5
													Continue

12-Feb-14	1290.96	1-May-14	1284.23	18-Jul-14	1310.78	6-Oct-14	1207.11	23-Dec-14	1176.32	11-Mar-15	1155.21	28-May-15	1187.97
13-Feb-14	1302.67	2-May-14	1299.45	21-Jul-14	1312.33	7-Oct-14	1208.85	24-Dec-14	1173.75	12-Mar-15	1153.58	29-May-15	1190.34
14-Feb-14	1318.48	5-May-14	1310.19	22-Jul-14	1306.26	8-Oct-14	1221.02	25-Dec-14	1173.6	13-Mar-15	1158.29	1-Jun-15	1189.06
17-Feb-14	1328.5	6-May-14	1307.87	23-Jul-14	1304.51	9-Oct-14	1224.15	26-Dec-14	1195.82	16-Mar-15	1154.68	2-Jun-15	1192.5
18-Feb-14	1321.85	7-May-14	1289.85	24-Jul-14	1293.54	10-Oct-14	1223.05	29-Dec-14	1183.02	17-Mar-15	1149.1	3-Jun-15	1184.68
19-Feb-14	1311.45	8-May-14	1289.39	25-Jul-14	1306.98	13-Oct-14	1235.68	30-Dec-14	1200.35	18-Mar-15	1167.37	4-Jun-15	1176.37
20-Feb-14	1322.9	9-May-14	1287.66	28-Jul-14	1303.95	14-Oct-14	1232.61	31-Dec-14	1181.33	19-Mar-15	1171.04	5-Jun-15	1171.8
21-Feb-14	1324.11	12-May-14	1295.81	29-Jul-14	1299.09	15-Oct-14	1241.9	1-Jan-15	1183.81	20-Mar-15	1182.42		
24-Feb-14	1336.8	13-May-14	1293.57	30-Jul-14	1296.12	16-Oct-14	1238.66	2-Jan-15	1188.47	23-Mar-15	1189.27		
25-Feb-14	1340.49	14-May-14	1305.87	31-Jul-14	1282.51	17-Oct-14	1238.09	5-Jan-15	1204.2	24-Mar-15	1193.06		
26-Feb-14	1330.55	15-May-14	1296.07	1-Aug-14	1293.66	20-Oct-14	1246.61	6-Jan-15	1218.46	25-Mar-15	1195.4		
27-Feb-14	1331.27	16-May-14	1293.28	4-Aug-14	1288.13	21-Oct-14	1248.56	7-Jan-15	1211.14	26-Mar-15	1204.62		
28-Feb-14	1326.24	19-May-14	1292.97	5-Aug-14	1288.67	22-Oct-14	1241.13	8-Jan-15	1208.7	27-Mar-15	1198.56		
3-Mar-14	1350.47	20-May-14	1294.09	6-Aug-14	1305.75	23-Oct-14	1231.72	9-Jan-15	1223.14	30-Mar-15	1185.85		
4-Mar-14	1334.33	21-May-14	1291.92	7-Aug-14	1312.45	24-Oct-14	1230.91	12-Jan-15	1233.14	31-Mar-15	1183.3		
5-Mar-14	1336.71	22-May-14	1294	8-Aug-14	1309.58	27-Oct-14	1226.38	13-Jan-15	1230.58	1-Apr-15	1203.85		
6-Mar-14	1350.74	23-May-14	1292.46	11-Aug-14	1308.37	28-Oct-14	1228.4	14-Jan-15	1228.55	2-Apr-15	1202.42		
7-Mar-14	1340.02	26-May-14	1301.04	12-Aug-14	1309.31	29-Oct-14	1212.05	15-Jan-15	1262.04	3-Apr-15	1200.75		
10-Mar-14	1339.56	27-May-14	1264.76	13-Aug-14	1312.71	30-Oct-14	1198.69	16-Jan-15	1280.26	6-Apr-15	1214.64		
11-Mar-14	1348.85	28-May-14	1258.01	14-Aug-14	1313.37	31-Oct-14	1172.64	19-Jan-15	1276.36	7-Apr-15	1209.06		
12-Mar-14	1366.8	29-May-14	1255.56	15-Aug-14	1304.52	3-Nov-14	1165.46	20-Jan-15	1294.65	8-Apr-15	1202.43		
13-Mar-14	1370.2	30-May-14	1249.49	18-Aug-14	1298.26	4-Nov-14	1168.26	21-Jan-15	1293.02	9-Apr-15	1194.76		
14-Mar-14	1382.84	2-Jun-14	1243.74	19-Aug-14	1295.67	5-Nov-14	1140.16	22-Jan-15	1301.73	10-Apr-15	1207.47		
17-Mar-14	1366.98	3-Jun-14	1244.88	20-Aug-14	1291.74	6-Nov-14	1141.49	23-Jan-15	1294.11	13-Apr-15	1198.39		
18-Mar-14	1355.54	4-Jun-14	1243.8	21-Aug-14	1276.64	7-Nov-14	1177.8	26-Jan-15	1281.16	14-Apr-15	1191.93		
19-Mar-14	1329.51	5-Jun-14	1253.47	22-Aug-14	1281.03	10-Nov-14	1151.25	27-Jan-15	1292.04	15-Apr-15	1202.23		
20-Mar-14	1327.67	6-Jun-14	1253.1	25-Aug-14	1276.67	11-Nov-14	1164.16	28-Jan-15	1283.56	16-Apr-15	1197.93		

Source: USA GOLD, (n.d.) Daily gold price history from Jan 02, 2014 to Jul 03, 2015.