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Modeling and Forecasting Sri Lankan Gold Prices

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Abstract

The movements of the prices of gold are both interesting and important. It can be forecasted and used for making future decisions. The main objective of this research study is to develop a forecasting model to predict gold prices in Sri Lanka with high accuracy. This study took monthly data of the gold prices per troy ounce in Sri Lanka from January 2005 to May 2014 which consists of, 113 observations. 90% observations were used for modeling and 10% observations were used for testing. This research study developed two models; Auto Regressive Integrated Moving Average (ARIMA) model and Vector Auto Regressive (VAR) model for forecasting monthly gold prices per troy ounce in Sri Lanka and a comparison was done to find the best model among them. Based on the literature and preliminary analysis, monthly data of Exchange rate (Sri Lankan rupees per dollar), inflation rate and narrow money supply (Rupees in million) were selected as the explanatory variables to build the VAR model. Mean Absolute Percentage Error (MAPE) value was used to asses the suitability of fitted models. ARIMA (2,1,2) model was selected as the best model to forecast monthly gold prices in Sri Lanka as this model comply with all conditions and assumptions of ARIMA. MAPE value of fitted data from ARIMA (2,1,2) model is 9.8855. According to the fitted VAR model it can be concluded that the change in the gold price of current month is affected by 94.03% of the change in the gold price of previous month. Percentage change of exchange rate, inflation rate and narrow money supply of the previous month are not individually affected to the percentage change of gold price of the current month meanwhile those variables are jointly affected to the percentage change of gold price of the current month.

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MAPE value of fitted data from VAR model is 12.45. The study found that identified two models are suitable to forecast gold prices in Sri Lanka for short time periods. When the forecasting time period is increasing percentage errors from the VAR model are higher than ARIMA (2,1,2) model. It can be concluded that the ARIMA(2,1,2) model is more appropriate to forecast gold prices in Sri Lanka than the fitted VAR model.

Keywords: Auto Regressive Integrated Moving Average; Vector Auto Regressive; Mean Absolute Percentage Error.

1. Introduction

Gold is a precious metal and it has been most popular commodity in the world. It is divided, as a commodity and a monetary asset. In the history, the people use gold as a token of wealth, as a refuge in time of war. Different nations have used gold to pay for the resources in the past. Currently the gold is stored in the treasury of each country as a token of wealth. Over the past few years, the demand for gold has expanded due to the increase in usage of gold for both industrial goods and jewelry sector.

Gold is one of the most important commodities in the world. It is the only commodity that retains its value during all periods of crises, savings, financial or political. From an economic point of view and financial point of view, the movements of the prices of gold are both interesting and important. It is often argued that the investment in gold is historically associated with the fears the rise of inflation and/or political risk. Though price of gold cannot be controlled, it can be measured, forecasted and used for future decisions.

Forecasting is a management function to facilitate decision-making. Price forecasting is an integral part of the economic decision-making process. The forecasts can be used in many ways. More precisely, individuals can use the forecasts in an attempt to earn an income from speculative activities, to determine the best policies of the government or to the commercial decision-making. Gold behaves less as a commodity that the long-term assets such as stocks or bonds, the price of gold are looking toward the future and today's prices strongly depends on the future of supply and demand. Prediction of gold prices is one of the most demanding task in the modern world [4].

Different mathematical models have been used for gold price forecasting in the literature such as Autoregressive Integrated Moving Average (ARIMA) model [6], Artificial Neural Network (ANN) model [10], Generalized Auto regressive Conditional Hetroskedasticity (GARCH) model, Threshold Autoregressive (TAR) models, Self-Exciting Threshold Autoregressive (SETAR) model, Smooth Transition Autoregressive (STAR) model [1] and etc. Between ARIMA and GARCH models some researchers have found that GARCH model was more appropriate than ARIMA model in their study [11]. The performance of hybridization of potential univariate time series specifically ARIMA models with the superior volatility model have investigated and GARCH incorporates with the formula of Box-Cox transformation in analyzing and forecasting gold price by [12].

Many studies can be found which focuses on factors affecting the prices of gold. Using MGARCH model, a broad study has been done by [13]. According to their empirical findings, highest correlation was found between gold prices and USA exchange rate which is negative and a positive correlation was found between gold prices and oil prices. Using Vector Error Correction Model the relationship between gold and oil, platinum, palladium, silver have examined by, [9]. They used the Johansen multivariate approach (VECM), co-integration and Granger causality test. Another study [5] found that inflation rates and exchange rates are negatively significant on gold prices, while a crude oil price is positively significant using a multiple linear regression model. Similar research were found in Sri Lanka. Modeling Volatility Series: With Reference to Gold Price is done by [7]. They modeled volatility and forecasted using GARCH-class models with long memory and fat-tail distributions, by considering an ARMA model.

The main objective of this study is to develop a forecasting model to predict price of gold in Sri Lanka with high accuracy. This paper discuss the determinants of the gold price comprised from some different macroeconomic factors that effect to the gold prices in Sri Lanka based on the literature & preliminary analysis.[13,5,4].

The rest of the paper is organized as follows: Section 2 describes material and methods. Section 3 presents the results of gold price modeling by ARIMA and VAR models, including comparison between two models. The conclusions of the study are discussed in Section 4. Finally references are in section 5.

2.Materials and Methods

2.1 Data and Preliminary analysis

In this study monthly data of gold prices per troy ounce (LKR) were used from January 2005 to September 2014 which consists of 113 observations. 90% observations were selected for modeling and 10% observations were used for testing. For the study, the Mean Absolute Percentage Error (MAPE) was calculated as forecast accuracy measurement.

Based on the literature and preliminary analysis, the determinants of the gold prices comprised from some different macroeconomic factors that effect to the gold prices in Sri Lanka were identified [12,13,5,4]. Preliminary analysis reveals that gold prices have a relationship with Exchange rate (Sri Lankan rupees per dollar), inflation rate and narrow money supply (Rupees in million) among the variables considered. Therefore monthly data of Exchange rate, inflation rate and narrow money supply were collected from the Central Bank of Sri Lanka as the explanatory variables to build the VAR model.

2.2 Autoregressive Processes (AR)

A time series $\{Xt\}$ is said to be an autoregressive process of order p (abbreviated AR(p)) if it is a weighted linear sum of the past pvalues plus a random shock so that

$$X_t = \phi_1 X_{t-1} + \cdots + \phi_p X_{t-p} + Z_t \qquad (1)$$

Where $\{Z_t\}$ denotes a purely random process with zero mean and constant variance σ_Z^2. Using the backward shift operator B, such that $X_t = X_{t-1}$, the AR(p) model may be written more succinctly in the form

$$\phi(B)X_t = Z_t \quad (2)$$

Where $\phi(B) = 1 - \phi_1 B - \ldots - \phi_p B^p$ is a polynomial in B of order p. ϕ_i's are constants [2].

2.3 Moving Average Processes (MA)

A time series $\{Xt\}$ is said to be a moving average process of order q (abbreviated MA(q)) if it is a weighted linear sum of the last q random shocks so that

$$X_t = Z_t + \theta_1 Z_{t-1} + \ldots + \theta_q Z_{t-q} \quad (3)$$

Where $\{Z_t\}$ denotes a purely random process with zero mean and constant variance σ_Z^2. Alternatively (3) can be written in the form

$$X_t = \theta(B) Z_t \quad (4)$$

Where $\theta(B) = 1 + \theta_1 B + \ldots + \theta_q B^q$ is a polynomial in B of order q. θ_i's are constants [2].

2.4 Auto Regressive Integrated Moving Average model, ARIMA (p,d,q)

A mixed auto regressive moving average model with p autoregressive terms and q moving average terms is abbreviated ARMA(p,q) and may be written as

$$X_t = \phi_1 X_{t-1} + \cdots + \phi_p X_{t-p} + Z_t + \theta_1 Z_{t-1} + \ldots + \theta_q Z_{t-q} \quad (5)$$

Where $\{Z_t\}$ is a purely random process with zero mean and constant variance σ_Z^2 and Z_t is independent of past values of X's. By using backward shift operator B, equation (5) can be written as

$$\phi(B)X_t = \theta(B)Z_t \quad (6)$$

Where $\phi(B) = 1 - \phi_1 B - \ldots - \phi_p B^p$ and $\theta(B) = 1 + \theta_1 B + \ldots + \theta_q B^q$ are polynomial equations of order p and q.

If X_t is replaced by $\nabla^d X_t$ in ARMA process then we have a model capable of describing certain types of non stationary series. Such a model is called integrated model.

$$\nabla^d X_t = (1 - B)^d X_t \quad (7)$$

$\{Xt\}$ is said to be ARIMA (p,d,q) process if $\nabla^d X_t = W_t$ is an ARMA (p,q) stationary process. [2]

2.5 Vector Auto Regressive (VAR) Model

According to Sims, if there is true simultaneity among a set of variables, they should all be treated on an equal footing; there should not be any a priori distinction between endogenous and exogenous variables. It is in this spirit that Sims developed his VAR model. We assume that each equation contains k lag values of M and R(two variables). In this case, one can estimate each of the following equations by OLS (Ordinary Least Square).

$$M_{1t} = \alpha + \sum_{j=1}^{k} \beta_j M_{t-j} + \sum_{j=1}^{k} \gamma_j R_{t-j} + u_{1t} \qquad (8)$$

$$R_t = \alpha' + \sum_{j=1}^{k} \theta_j M_{t-j} + \sum_{j=1}^{k} \gamma_j R_{t-j} + u_{2t} \qquad (9)$$

Where the u's are the stochastic error terms, called impulses or innovations or shocks in the language of VAR, t is time and $\alpha, \beta, \gamma, \alpha', \theta$ are constants. Before we estimate (8) and (9) we have to decide on the maximum lag length, k.

One way of deciding the maximum lag is, use a criterion like Akaike or Schwarz and choose the model that gives the lowest values of these criteria[3].

2.6 Forecast Accuracy Measurement

There are several measures for evaluating forecasts. For the current study, the mean absolute percentage error (MAPE) was used. MAPE measures the accuracy of forecast in terms of percentage. When comparing performance of two models, smaller value of MAPE, indicates better model.

The formula is as follows:

$$\text{MAPE}=\left(\left(\sum_{t=1}^{n} \left|\frac{yt-y^{\wedge}t}{yt}\right|\right)/n\right)X100 \qquad (10)$$

Where yt is the actual value; $y^{\wedge}t$ is the forecast value; n is the number of periods [15].

3. Results

This section describes the results of this research study. There are four subsections in this section. Auto Regressive Integrated Moving Average (ARIMA) model, Vector Auto Regressive (VAR) model, Model Comparison and Limitations of the study and Recommendations.

3.1 Auto Regressive Integrated Moving Average (ARIMA) model

Monthly data of gold prices per troy ounce (LKR) were used for ARIMA model since January 2005 to September 2014. As the variance of the data is not constant, log transformation was used [2].

After examining the variance of the data set, stationary of the log transformation of gold prices was inspected using Kwiatkowski–Phillips–Schmidt–Shin (KPSS) stationary test and Unit Root Tests; Augmented Dickey–Fuller test (ADF), Phillips–Perron test (PP). Results obtained from Unit Root Tests (ADF & PP) and KPSS stationary test for the 1st difference of log transformation of gold prices are shown in Table 1.

Table 1: Unit root tests and KPSS test for the 1st difference of log transformation of gold prices

1st difference			
	ADF	PP	KPSS
	t statistics	t statistics	LM-stat
1st difference of log(gold price)	-9.7642	-9.7423	0.0776
1%	-4.0428	-4.0428	0.2160
5%	-3.4508	-3.4508	0.1460
10%	-3.1508	-3.4508	0.1190

In Table 1, results of unit root tests and KPSS test depict that 1st difference of log transformation of gold prices are stationary. Different ARIMA models were fitted for the data and the best model was selected as ARIMA(2,1,2) where all the coefficients are significant only in this model. The selection is based on observing the ACFs and PACFs.ARIMA (2,1,2) model was selected as the best model to forecast monthly gold prices in Sri Lanka as this model comply with all conditions and assumptions of ARIMA. Table 2 summarizes the ARIMA (2,1,2) model and significance of the coefficients displays in Table 3. Residual analysis is in Figure 1 and Figure 2.

Table 2: Finale estimates of parameters

Type	**Coefficient**	**SE Coeff:**	**T**	**P**
AR 1	-1.2099	0.4765	-2.54	**0.013**
AR 2	-0.8031	0.3424	-2.35	**0.021**
MA 1	-1.3060	0.4784	-2.73	**0.008**
MA 2	-0.8385	0.3830	-2.19	**0.031**
Constant	0.04204	0.0136	3.10	**0.003**

According to Table 2, it can be concluded that all coefficients are significant at 5% level of significance in the fitted model, ARIMA(2,1,2).

Table 3: Modified Box-Pierce (Ljung-Box) Chi Square statistic

Lag	12	24	36	48
Chi-Square	6.3	15.7	26.7	34.9
DF	7	19	31	43
P-Value	**0.500**	**0.677**	**0.685**	**0.807**

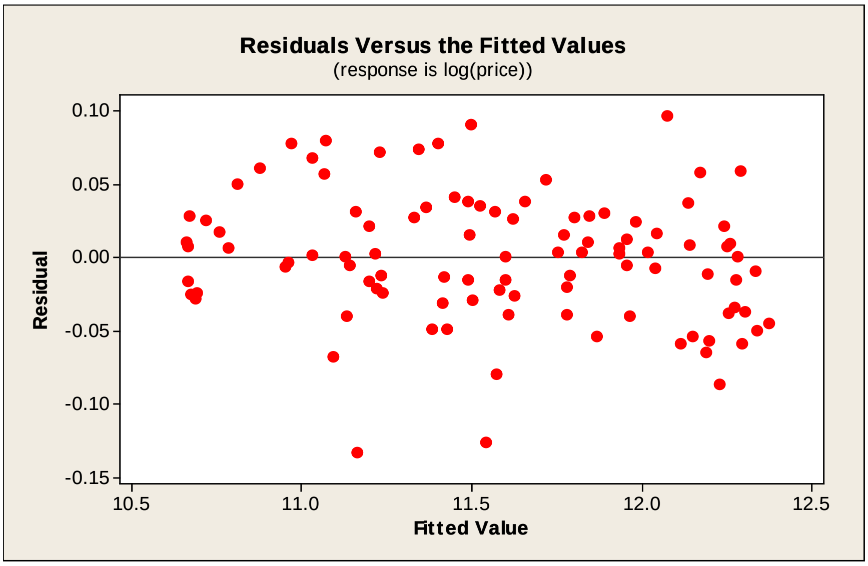


Figure 1: Residual vs the Fitted values of ARIMA (2,1,2) model

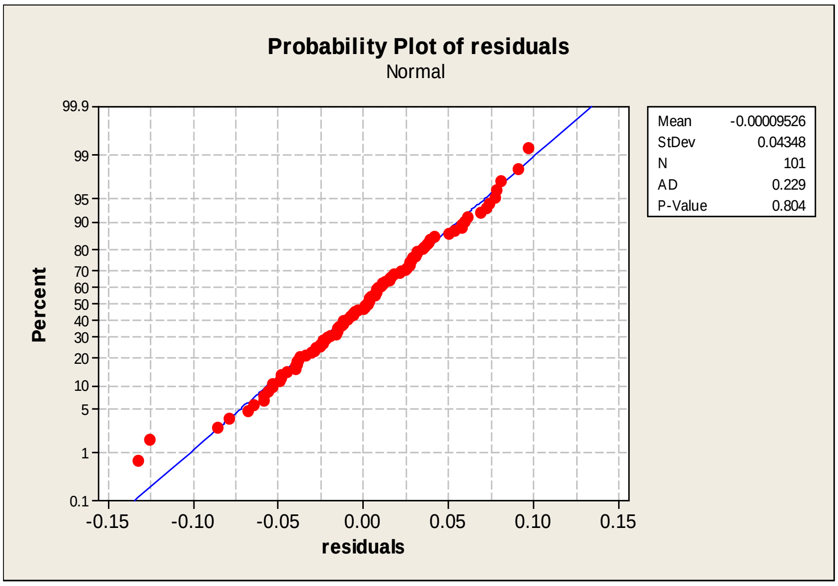


Figure 2: Normal probability plot of residuals of ARIMA(2,1,2)

Table 3 shows that the residuals are uncorrelated at the 5% level of significance. According to the Figure 2, there is no hetroskedasticity since there is no any pattern observed in residual vs fitted values. Normal probability plot of residuals of ARIMA (2,1,2) shows that residuals are normally distributed with reference to the Anderson-Darling value (0.229) which is less than the probability value (0.804). After the model estimation and diagnostic checking it can be concluded that this model is suitable for forecasting.

3.2 Vector Auto Regressive (VAR) Model

To build the VAR model monthly data of Exchange rate (Sri Lankan rupees per dollar), inflation rate and narrow money supply (Rupees in million) were collected from the Central Bank of Sri Lanka as the explanatory variables based on literature & preliminary analysis. Log transformation of gold prices and explanatory variables were used to stabilize the variance of a series [8]. Before build the VAR model, stationary of log transformation of all variables (gold prices, exchange rate, inflation rate and narrow money supply) were examined. Results of the stationary are shown in Table 4(a), 4(b), 4(c) and 4(d).

Table 4: Unit root tests for 1st difference of all variables

a: Log of gold price

	ADF	PP	KPSS
	t statistics	t statistics	LM-stat
dL(gold)	-9.7642	-9.7423	0.0776
1%	-4.0428	-4.0428	0.2160
5%	-3.4508	-3.4508	0.1460
10%	-3.1508	-3.4508	0.1190

b: Log of inflation rate

	ADF	PP	KPSS
	t statistics	t statistics	LM-stat
dL(inf)	-5.0110	-10.6976	0.0447
1%	-3.4908	-3.4902	0.7390
5%	-2.8879	-2.8877	0.4630
10%	-2.5809	-2.5808	0.3470

c: Log of exchange rate

	ADF	PP	KPSS
	t statistics	t statistics	LM-stat
dL(Ex)	-6.6676	-6.8539	0.0456
1%	-3.4902	-3.4902	0.7390
5%	-2.8877	-2.8877	0.4630
10%	-2.5808	-2.5808	0.3470

d: Log of money supply(M1)

	ADF	PP	KPSS
	t statistics	t statistics	LM-stat
dL(M1)	-13.1819	-13.0476	0.0714
1%	-4.0428	-4.0428	0.2160
5%	-3.4508	-3.4508	0.1460
10%	-3.1508	-3.1508	0.1190

According to Table 4(a), 4(b), 4(c) and 4(d), it can be said that the log (Gold price), log (Inflation rate), log (Exchange rate) and log (money supply) are stationary at 1st difference. To build the VAR model log (Gold price), log (Inflation rate), log (Exchange rate) and log (money supply) were used.

dL(gold) = 1st difference of log transformation of gold price

dL(Ex) = 1st difference of log transformation of exchange rate

dL(inf) = 1st difference of log transformation of inflation rate

dL(M1) = 1st difference of log transformation of narrow money supply

Vector Auto Regressive model (VAR) and Vector Error Correction model (VECM) is selected based on the cointegration. If there is cointegration then it may advise to run VECM. If there is no cointegration then it may advise to run VAR model. Before test the cointegration, need to select the optimum lag [3]. Results of Optimum lag selection are shown in Table 5(a) and Johansen Cointegration Test results are shown in Table 5(b).

Table 5: Results of Optimal Lag Selection and Johansen Cointegration Test

a: Optimum Lag selection

Lag	Schwarz information criteria (SC)
0	-2.5557
1	-13.3408 *
2	-12.9643
3	-12.8453
4	-12.4144
5	-11.7846

b: Johansen Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.1336	25.2185	47.85613	0.9127
At most 1	0.0511	9.3063	29.79707	0.9887
At most 2	0.0308	3.4837	15.49471	0.9407
At most 3	9.55E-05	0.0106	3.841466	0.9177

Trace test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 5(a) shows the results of optimum lag selection. Based on Schwarz Information Criteria optimum lag was selected. Because the lowest Schwarz information criterion (SC) is present from lag 1, it can be concluded that optimum lag is lag 1. Then using lag 1 cointegration was tested; results are shown in table 5(b). According to Johansen Cointegration Test, there is no cointegration at the 5% level of significance. Therefore Vector Autoregressive Model was used in the analysis.

Estimated VAR model is;

LOG_PRICE = 0.940*LOG_PRICE(-1)- 0.012*LOG_INF(-1) + 0.007*LOG_EX(-1)+ 0.075*LOG_M1(-1) -0.3 (11)

Where

LOG_PRICE	= Log transformation of the gold price of current month
LOG_PRICE(-1)	= Log transformation of the gold price of previous month
LOG_INF(-1)	= Log transformation of the inflation rate of previous month
LOG_EX(-1)	= Log transformation of the Exchange rate of previous month
LOG_M1(-1)	= Log transformation of the money supply of previous month

Table 6 shows the results of the significance of the VAR model.

Table 6: Significance of the VAR the model

LOG_PRICE = C(1)*LOG_PRICE(-1) + C(2)*LOG_INF(-1) + C(3)*LOG_EX(-1) + C(4)*LOG_M1(-1) + C(5)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.9403	0.0412	22.8445	0.0000
C(2)	-0.0121	0.0066	-1.8277	0.0707
C(3)	0.0069	0.1128	0.0613	0.9513
C(4)	0.0745	0.0669	1.1147	0.2677
C(5)	-0.2998	0.6709	-0.4472	0.6558

R-squared	0.9928	Mean dependent var	11.5763
Adjusted R-squared	0.9925	S.D. dependent var	0.5006
S.E. of regression	0.0433	Akaike info criterion	-3.3914
Sum squared resid	0.1803	Schwarz criterion	-3.2619
Log likelihood	176.2662	Hannan-Quinn criter.	-3.3390
F-statistic	3311.8220	Durbin-Watson stat	1.8507
Prob(F-statistic)	0.000000		

According to the Table 6, only C (1) is individually significant and others are not individually significant. But other variables are jointly significant according to the F statistic. Therefore variables which are not individually significant cannot remove from the model. C (1) means the coefficient of the previous month's log (gold price). According to the coefficient C (1), change in the gold price of current month is affected by 94.03% of the change in the gold price of previous month.

Table 7 illustrates results for testing Hetroskedasticity and correlation of the residuals. Table 7(a) shows results for testing Hetroskedasticity of residuals while results for testing correlation of residuals are shown in Table 7(b). Figure 4 illustrate results for testing normality of residuals of fitted VAR model.

Probability of observed R-squared (0.1402) is greater than 0.05 in Table 7(a). It reveals that there is no Heteroskedasticity in this VAR model at 5% level of significance.Table 7(b) exhibits that residuals are not serially correlated at 5% level of significance since probability of Observed R-Squared(0.4889) is greater than 0.05. According to the Jarque-Bera statistics results in Figure 4, it can be concluded that residuals are normally distributed at 5% level of significance because probability of Jarque-Bera statistic value (0.5594) is greater than 0.05. After the model estimation and residual analysis it can be concluded that identified VAR model is suitable for any other further analysis and forecasting.

3.3 Model Comparison

This section consist with the model comparison. Since July 2013 to May 2014 data set used for validation and model comparison. Table 8 displays actual data, forecasted data, percentage error Mean Absolute Percentage Error (MAPE) value of ARIMA (2,1,2) model and VAR model.

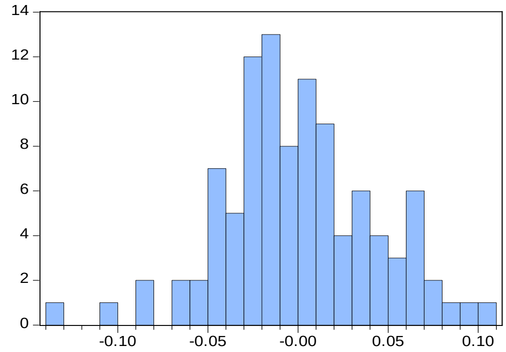
Table 7: Results for testing Hetroskedasticityand correlation of residuals

a: Results for testing Hetroskedasticity of residuals

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.765302	Prob. F(4,96)	0.1422
Obs*R-squared	6.919985	Prob. Chi-Square(4)	0.1402
Scaled explained SS	7.816610	Prob. Chi-Square(4)	0.0985

b: Results of testing correlation of residulas

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.452724	Prob. F(1,95)	0.5027
Obs*R-squared	0.479034	Prob. Chi-Square(1)	0.4889



Series: Residuals	
Sample 2005M02 2013M06	
Observations 101	
Mean	2.01e-15
Median	-0.003227
Maximum	0.102651
Minimum	-0.135467
Std. Dev.	0.042461
Skewness	-0.079844
Kurtosis	3.500596
Jarque-Bera	1.161908
Probability	0.559364

Figure 3: Results for Testing Normality of residuals

According to the Table 8, it is clear that the forecast values are closer to actual values in first few months in both ARIMA (2,1,2) model and VAR model. The percentage errors of two models are increasing after first 4 months. Therefore it can be concluded that these two models are more suitable to forecast Sri Lankan Gold prices for short periods. When comparing two models it can be seen that increasing of the percentage errors of VAR model are higher than increasing of the percentage errors of ARIMA (2,1,2) model. This may be due to high MAPE value is obtained from the VAR model than the ARIMA (2,1,2) model. Table 8 shows that MAPE value from the ARIMA (2,1,2) model is 9.8855 while the MAPE value of the VAR model is 12.45.With reference to MAPE values obtained, it can be said that ARIMA (2,1,2) model is appropriate as the forecasting accuracy measure, the study conclude that ARIMA (2,1,2) model is more appropriate model to forecast the monthly gold prices in Sri Lanka than the fitted VAR model.

Table 8: Actual data, Forecasted data, percentage error and MAPE value of fitted ARIMA (2,1,2)&VAR models

Month	**ARIMA(2,1,2) model**			**VAR model**		
	Actual data	Forecasted data	Percentage error %	Actual data	Forecasted data	Percentage error (%)
13-Jul	168469	173027	**-2.7051**	168469	174360	**-3.4965**
13-Aug	178198	175677	**1.4148**	178198	177219	**0.5492**
13-Sep	178652	178760	**-0.0606**	178652	180110	**-0.8159**
13-Oct	172603	180340	**-4.4826**	172603	183118	**-6.0918**
13-Nov	167230	183506	-9.7322	167230	186435	-11.4840
13-Dec	159816	186074	-16.4310	159816	189209	-18.3920
14-Jan	162661	188189	-15.6940	162661	193196	-18.7720
14-Feb	169995	191473	-12.6350	169995	197053	-15.9170
14-Mar	174505	193784	-11.0480	174505	201225	-15.3120
14-Apr	169606	196438	-15.8200	169606	205830	-21.3570
14-May	168116	199586	-18.7190	168116	209697	-24.7340
	MAPE = 9.8855			MAPE = 12.45		

3.4 Limitations of the study and Recommendations

There are few limitations of the study. Monthly gold prices were predicted in this study instead of daily gold prices as most of the daily data of explanatory variables related to gold prices except exchange rates are not available. Few explanatory variables were considered in model building where monthly data are available and some other variables were not considered as their data are available only quarterly or annually.

As a developing country, gold prices forecasting is very important to the gold market in Sri Lanka to assess profits and losses. Making decisions based inaccurate information can result in large losses. Analyzing factors that affect to the gold prices and forecasting will help to the gold market such that businessmen, investors for banks and etc. in Sri Lanka. In this research study gold prices were forecasted using ARIMA and VAR model. Further studies can be used other advanced models to forecast gold prices such as Neural Network, GARCH, ARCH and etc. Furthermore daily gold prices can be forecasted using ARIMA, GARCH, ARCH, Neural Network models. Few factors that affect to the gold price were used in this research study. This study can be expanded by considering other factors affecting the gold prices. Similarlyworld gold prices can be forecasted using those models. Other commodity prices can also be forecasted using these models.

4. Conclusion

The percentage change of gold price of previous month is highly affected to the percentage change of the gold price of current month.As a figure it was identified that the change in the gold price of current month is affected by 94.03% of the change in the gold price of previous month. Based on the results of the VAR model it can be concluded that percentage change of exchange rate (Sri Lankan rupees per dollar) value of previous month, percentage change of inflation rate value of previous month and percentage change of money supply value of previous month are not individually affected to the percentage change of gold price of current month meanwhile they are jointly affected to the percentage change of gold price of current month. According to the percentage errors of fitted model, it can be concluded that these two models are more suitable to forecast Sri Lankan Gold prices for short periods. Using mean absolute percentage error (MAPE) as the forecasting accuracy measure, the study conclude that ARIMA(2,1,2) model is more appropriate model to forecast the monthly gold prices in Sri Lanka than the fitted VAR model.

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