



# RELATIONSHIP BETWEEN EXCHANGE RATE AND MACROECONOMIC AGGREGATES- THE CASE OF KUWAIT DINAR AND UNITED STATES DOLLAR

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## **Abstract:**

The extent for the international trade is affected by the currency exchange rate. There are several macroeconomic factors that determine the KWD (Kuwait Dinar) to USD (United State Dollar) exchange rate. This study tests the association and its significance between specific macroeconomic factors and the KWD to USD exchange rate. The gross domestic product (GDP), the consumer price index (CPI) and the oil price have been selected to test the correlation, association, and the significant of it with the exchange rate. The data were taken on a quarterly basis after verification with Kuwait central bank data. Analysis was done using Excel's regression analysis. Results show significance between both association between the exchange rate and oil prices and CPI but not with GDP. The overall association between the exchange rate and the collectively all variables is significant. Therefore, these variables must be considered by policy makers because they can impact the exchange rate and consequently the trade balance.

**Keywords:** Exchange rate, GDP, CPI, Regression, Autoregression

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**Introduction:**

The exchange rate is the number of units which can be exchanged for a unit of domestic currency. The exchange of products with international partners is facilitated through the exchange rate of the currency. The fluctuation in the currency exchange rate can be due to certain uncontrolled factors, creating a risk due to the unpredicted exchange rate volatility. The economic situation locally and at the international level can impact the exchange rates. There are certain macroeconomic factors that impact the exchange rate. This study covers three important macroeconomic factors which can affect the exchange rate. These are the oil prices, CPI, and GDP. The relationship between the exchange rate and the CPI is negatively correlated, whereas GDP and oil prices have positive correlation with exchange rate (Kashif 2000), (Chit et al 2010).

**Exchange rate system**

This exchange rate is maintained within a narrow limit beyond which the government intervenes to control exchange rates. This fixed exchange rate was followed by governments as recommended by Bretton Woods Conference between 1944 and 1971. In contrast, the freely floating exchange rate system has exchange rates changing without interference by the government to maintain the rates. The third system is the managed float exchange rate system in which the supply and demand of currency determines the policy to be followed to benefit from these fluctuations. Edwards (2000) investigated the association between exchange rate and capital flows and currency crises in emerging economies. It was concluded that under the appropriate conditions and policies, floating exchange rates can be effective and efficient.

**Review of Literature**

The exchange rate is a dynamic variable, whose mobility is determined by a wide range of economic, financial, political and social factors (Voinea, 2004, p.134), the most important being the following GDP, inflation rate, money supply, interest rate and balance of payments.

In a research study by Simon (1997) it was concluded that exchange rate has direct and positive relationship with inflation. The study draws on the facts that one must keep a track of inflation rate changes to predict the changes in currency exchange rates.

In a research study Harberger (2003) researched the impact of economic growth on real exchange rate. He concluded that there is a lack of systematic connection between economic growth and real exchange rate.

Husain et al. (2004) concluded in their study that weaker and under developed countries have very little access to international capital therefore low rate of inflation and higher level of durability is

associated with fixed exchange rate regime in those countries. However, it was further concluded in the study that there is no major relationship between economic performance and exchange rate regime in the developing economies. They also found that developed economies may experience stable and slightly higher level of growth rate without higher level of inflation in flexible exchange rate regime.

Due and Sen (2006) examined the interactions between multitude of macroeconomic factors- the real exchange rate, level of capital flows in Indian economy for the period 1993 to 2004. The estimations indicate that the variables are cointegrated.

## Methodology

Secondary data were obtained from <https://www.boursakuwait.com.kw/en/data-and-research/economic-indicators/economic-indicators>; <https://www.indexmundi.com/commodities/?commodity=crude-oil&months=120&currency=kwd>; and <https://www.exchangerates.org.uk/KWD-USD-spot-exchange-rates-history-2020.html>.

Data were verified by direct comparison with other data published by Kuwait Central Bank. Data at the end of each quarter were selected for analysis. The analysis includes quarter one 2016 to quarter four 2020. The GDP of quarter four 2020 is an estimate based on previous two quarters for the lack of published data by the central bank of Kuwait specific to that quarter. The Excel's regression analysis and autoregression analysis have been used to analyse the secondary data.

## Results and Analysis

### Hypothesis -1

$H_0$  = There is no association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X) – oil prices in Kuwait

$H_1$  = There is an association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X) – oil prices in Kuwait

Hypothesis at 5% significance level. (This means 95% confidence level i.e.; we are true about our results in 95% the cases and there is a chance of 5% of our results being out of range or due to randomness)

### **Result and Interpretation about association between exchange rate and oil prices**

Table – 1 shows R square = 0.2350 indicates that about 23.50% of the variation in the dependent variable (Y) are explained by the independent variable (X). Further significance F value = 0.030285 is less than the 0.05 (5%) this shows that the association between dependent variable (Y) and independent variable (X) is statistically significant.

The regression equation is as follows.

$$Y = 3.2148256 + 0.0044612X$$

Here the intercept value = 3.2148256 shows that when value of independent variable (X) is zero then the value of dependent variable = 3.2148256. The slope of the curve i.e., regression coefficient of X = 0.0044612, this shows a positive association between these two variables. A one unit increase in the independent variable (X) will lead to 0.0044612 increase in the dependent variable (Y).

The P-value of independent variable (X) is less than the significance level (0.05) which is the strong evidence that the null hypothesis is invalid, hence null hypothesis is rejected and we accept the alternate hypothesis - There is an association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X) – oil prices in Kuwait.

### **Hypothesis -2**

$H_0$  = There is no association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X1)– Consumer price index (CPI) of Kuwait

$H_1$  = There is an association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X1)– Consumer price index (CPI) of Kuwait

Hypothesis tested at 5% significance level.

### **Result and Interpretation about association between exchange rate and consumer price index**

Table-2 shows R square = 0.24628732 indicates that about 24.63 % of the variation in the dependent variable (Y) are explained by the independent variable (X1). Further significance F value = 0.02604005 is less than the 0.05 (5%) this shows that the association between dependent variable (Y) and independent variable (X1) is statistically significant.

The regression equation is as follows

$$Y = 4.11718811 - 0.007307X_1$$

Here the intercept value = 4.11718811 shows that when value of independent variable ( $X_1$ ) is zero then the value of dependent variable = 4.11718811. The slope of the curve i.e., regression coefficient of  $X_1 = -0.007307$ , this shows a negative association between these two variables. A one unit increase in the independent variable ( $X_1$ ) will lead to -0.007307 decrease in the dependent variable ( $Y$ ).

The P-value of the independent variable ( $X_1$ ) is less than the significance level (0.05) which is the strong evidence that the null hypothesis is invalid, hence null hypothesis is rejected and we accept the alternate hypothesis - There is an association between dependent variable ( $Y$ ) – KWD/USD exchange rate and CPI of Kuwait ( $X_1$ ).

### Hypothesis -3

$H_0$  = There is no association between dependent variable ( $Y$ ) – KWD/USD exchange rate and independent variable ( $X_2$ ) – GDP at market value of Kuwait.

$H_1$  = There is an association between dependent variable ( $Y$ ) – KWD/USD exchange rate and independent variable ( $X_2$ ) – GDP at market value of Kuwait.

Hypothesis was tested at 5% significance level.

### Result and Interpretation about association between exchange rate and GDP

Table -3 shows R square = 0.134417 indicates that about 13.44 % of the variation in the dependent variable ( $Y$ ) are explained by the independent variable ( $X_2$ ). Further significance F value = 0.11183857 is more than the 0.05 (5%) this shows that the association between dependent variable ( $Y$ ) and independent variable ( $X_1$ ) is statistically not significant.

The regression equation is as follows.

$$Y = 3.078477 + 0.0000214X_2$$

Here the intercept value = 3.078477 shows that when value of independent variable ( $X_2$ ) is zero then the value of dependent variable ( $Y$ ) = 3.078477. The slope of the curve i.e., regression coefficient of  $X_2 = + 0.0000214$ , this shows a positive association between these two variables. A one unit increase in the independent variable ( $X_2$ ) will lead to + 0.0000214 increase in the dependent variable ( $Y$ ).

The P-value of the independent variable (X2) is more than the significance level (0.05) which is the strong evidence that the null hypothesis is valid, hence null hypothesis is accepted and we reject the alternate hypothesis - There is a no association between dependent variable (Y) – KWD/USD exchange rate and GDP of Kuwait (X2).

#### **Hypothesis -4**

$H_0$  = There is no association between dependent variable (Y) – KWD/USD exchange rate and three independent variables Oil Price in Kuwait(X), CPI of Kuwait (X1), GDP at Market Value of Kuwait (X2)

$H_1$  = There is an association between dependent variable (Y) – KWD/USD exchange rate and three independent variables Oil Price in Kuwait(X), CPI of Kuwait (X1), GDP at Market Value of Kuwait (X2)

Hypothesis was tested at 5% significance level.

#### **Result and Interpretation of multiple variable regression association between exchange rate and oil prices, CPI and GDP**

Table -4 depicts R square = 0.459953345 indicates that about 45.99 % of the variation in the dependent variable (Y) is explained by these three independent variables (X, X1 and X2) collectively. Further significance F value = 0.017395525 is less than the 0.05 (5%) this shows that the association between dependent variable (Y) and these three-independent variable (X, X1 and X2) are statistically significant.

The regression equation is as follows.

$$Y = 4.487825637 + 0.004311301X - 0.009836319X1 - 0.0000157X2$$

Here the intercept value = 4.487825637 shows that when value of these three independent variables (X, X1 and X2) is zero then the value of dependent variable (Y) = 4.487825637. The regression coefficient of X = +0.004311301 this shows a positive association between Y and X. Whereas regression coefficient of X1 = -0.009836319 and X2 = -0.0000157, this shows that both of these independent variables have negative association with the dependent variable (Y).

The P-value of the independent variable X = 0.024162 is less than the significance level (0.05), this is the strong evidence that null hypothesis is not valid, and we reject the null hypothesis. whereas P-value of X1 = 0.052828 and of X2 = 0.41812 is more than the significance level (0.05) which is the strong evidence that the null hypothesis is valid, hence null hypothesis is accepted and we reject the alternate hypothesis - There is a no association between dependent variable (Y) – KWD/USD exchange rate and independent variable X1 – CPI of Kuwait and X2 - GDP of Kuwait. Whereas there is an association between Y and X.

### **Result and Interpretation About Autoregression of oil prices (X) and the oil prices X(t-1), X(t-2) and X(t-3)**

Table – 5 depicts R square = 0.282507 indicates that about 28.25 % of the variation in the dependent variable (X) is explained by these three independent variables X(t-1), X(t-2), and X(t-3) collectively. Further significance F value = 0.214783 is more than the 0.05 (5%) this shows that the association between dependent variable (X) and these three-independent variable X(t-1), X(t-2), and X(t-3) are statistically insignificant.

The regression equation is as follows.

$$X = 8.100764 + 0.4605X(t-1) + 0.175031X(t-2) - 0.11717X(t-3)$$

Here the intercept value = 8.100764 shows that when values of these three independent variables (X(t-1), X(t-2) and X(t-3)) are zero then the value of dependent variable (X) = 8.100764. Positive associations from regression coefficients of X(t-1) = 0.4605; X(t-2) = 0.175031, whereas the regression coefficient of X(t-2) = -0.11717, showing negative associations.

The P-value of the independent variables of X(t-1), X(t-2), and X(t-3) = 0.1167, 0.571098, 0.669157, respectively. These p-values show insignificant associations between the dependent variable and each of the independent variables.

### **Result and Interpretation About Autoregression of the dependent variable of CPI and the X1(t-1), X1(t-2), and X1(t-3)**

Table – 6 depicts R square = 0.969363 indicates that about 96.93 % of the variation in the dependent variable (X1) is explained by these three independent variables X1(t-1), X1(t-2), and X1(t-3) collectively. Further significance F value = 4.34E-10 is less than the 0.05 (5%) this shows that the association between dependent variable (X1) and these three-independent variable X1(t-1), X1(t-2), and X1(t-3) are statistically significant.

The regression equation is as follows.

$$X1 = -26.6086 + 1.004133X1(t-1) - 0.23619X1(t-2) + 0.47172X1(t-3)$$

Here the intercept value = -26.6086 shows that when values of these three independent variables (X1(t-1), X1(t-2) and X1(t-3)) are zero then the value of dependent variable (X1) = -26.6086. Positive associations from regression coefficients of X1(t-1) = 1.004133; X1(t-3) = 0.47172, whereas the regression coefficient of X1(t-2) = -0.23619, showing negative associations.

The P-value of the independent variables of  $X1(t-1)$ ,  $X1(t-2)$ , and  $X1(t-3) = 9.47E-05$ ,  $0.39461$ ,  $0.031236$ , respectively. These p-values  $X(t-1)$  and  $X1(t-3)$  show significant associations with the dependent variable  $X1$ , whereas the p value of  $X1(t-2)$  shows insignificant association with the dependent variable.

### **Result and Interpretation About Autoregression of GDP (X2) and the $X2(t-1)$ , $X2(t-2)$ , and $X2(t-3)$**

Table – 7 depicts  $R\text{ square} = 0.566450664$  indicates that about 56.64 % of the variation in the dependent variable ( $X2$ ) is explained by these three independent variables  $X2(t-1)$ ,  $X2(t-2)$ , and  $X2(t-3)$  collectively. Further significance F value =  $0.010492$  is less than the  $0.05$  (5%) this shows that the association between dependent variable ( $X2$ ) and these three-independent variable  $X2(t-1)$ ,  $X2(t-2)$ , and  $X2(t-3)$  are statistically significant.

The regression equation is as follows.

$$X1 = -2311.83309 + 0.816151828X2(t-1) - 0.04813011X2(t-2) + 0.451193749X2(t-3)$$

Here the intercept value =  $-2311.83309$  shows that when values of these three independent variables ( $X2(t-1)$ ,  $X2(t-2)$  and  $X2(t-3)$ ) are zero then the value of dependent variable ( $X1$ ) =  $-2311.83309$ . Positive associations from regression coefficients of  $X2(t-1) = 0.816151828$ ;  $X2(t-3) = 0.451193749$ , whereas the regression coefficient of  $X2(t-2) = -0.04813011$ , showing negative associations.

The P-value of the independent variables of  $X2(t-1)$ ,  $X2(t-2)$ , and  $X2(t-3) = 0.009428641$ ,  $0.891049773$ ,  $0.376106151$ , respectively. The p-value  $X2(t-1)$  show significant association between  $X2(t-2)$  and the dependent variable  $X2$ , whereas the independent variables  $X2(t-2)$ , and  $X2(t-3)$  show insignificant associations between the dependent variable  $X2$  and the independent variables  $X2(t-2)$  and  $X2(t-3)$ .



## Conclusion

The regression analysis leads to the following conclusion:

1. Dependent variable (Y) – KWD/USD exchange rate has a positive association with the independent variable(X) – Oil prices in Kuwait. Regression coefficient of X is positive and it is statistically significant at 5% significance level.
2. There is a negative association between dependent variable (Y) – KWD/USD exchange rate and independent variable (X1) – CPI of Kuwait. And regression coefficient of X1 is negative and it is statistically significant at 5% significance level.
3. Dependent variable (Y) – KWD/USD exchange rate has a very low positive association with the independent variable(X2) – GDP of Kuwait. Regression coefficient of X2 is positive and it is statistically not significant at 5% significance level.
4. Result of hypothesis of association between the dependent variable – KWD/USD exchange rate and independent variables when considered individually show that the independent variable X – Oil Price in Kuwait, and X1 – CPI of Kuwait have significant association with the KWD/USD exchange rate. Whereas, independent variable GDP of Kuwait has no association with the KWD/USD exchange rate.
5. Result of multiple regression analysis show that all these three independent variables collectively explain about 45.99 % of the variation in the dependent variable ( KWD/USE exchange rate) but the interpretation of P-value of ANOVA strongly support that the association of independent variable X1 – CPI of Kuwait and X2 – GDP of Kuwait is not significant statistically, whereas association of independent variable X – Oil Prices in Kuwait has low P-value indicating statistically significant association between KWD/USD exchange rate and Oil price in Kuwait.
6. Result of autoregression analysis show significant associations between the dependent variables and the independent variables of each of CPI and GDP, but not the oil prices.

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- Oil Prices: <https://www.indexmundi.com/commodities/?commodity=crude-oil&months=120&currency=kwd>

**Table 1: Regression Analysis KWD/USD vs. Oil Prices**

(KWE/USA is dependent variable (Y) and Oil Prices is independent variable (X))

<i>Regression Statistics</i>								
Multiple R	0.4847792							
R Square	0.2350109							
Adjusted R Square	0.1925115							
Standard Error	0.0283277							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.004437396	0.004437	5.529748	0.030285			
Residual	18	0.014444262	0.000802					
Total	19	0.018881658						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3.2148256	0.031418325	102.3233	2.4E-26	3.148818	3.280833	3.14881815	3.2808331
Oil Prices (KWD per barrel) (X)	0.0044612	0.001897119	2.351542	0.030285	0.000475	0.008447	0.00047546	0.0084469

**Table 2: Regression Analysis KWD/USD (Y) vs. CPI of Kuwait (X1)**

<i>Regression Statistics</i>								
Multiple R	0.49627344							
R Square	0.24628732							
Adjusted R Square	0.2044144							
Standard Error	0.02811815							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.00465031	0.00465	5.88178	0.02604005			
Residual	18	0.01423134	0.000791					
Total	19	0.01888166						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	4.11718811	0.34229142	12.02831	4.86E-10	3.39806053	4.83631569	3.39806053	4.83631569
CPI (X1)	-0.007307	0.00301289	-2.42524	0.02604	-0.0136368	-0.0009771	-0.0136368	-0.0009771

**Table 3: Regression Analysis KWD/USD (Y) vs. GDP at Market Value of Kuwait (X2)**

<i>Regression Statistics</i>								
Multiple R	0.366629							
R Square	0.134417							
Adjusted R Square	0.086329							
Standard Error	0.030133							
Observations	20							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.002538007	0.002538	2.795222	0.11183857			
Residual	18	0.016343651	0.000908					
Total	19	0.018881658						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3.078477	0.125017992	24.62427	2.59E-15	2.81582417	3.34113	2.815824	3.34113
GDP at Market Value (Million KWD) (X2)	2.14E-05	1.28106E-05	1.671892	0.111839	-5.496E-06	4.83E-05	-5.5E-06	4.83E-05

**Table 4: Regression Analysis between dependent variable (Y) - KWD/USD Exchange Rate and three independent variables - Oil Price in Kuwait(X), CPI of Kuwait (X1), GDP at Market Value of Kuwait (X2)**

<i>Regression Statistics</i>								
Multiple R	0.678198603							
R Square	0.459953345							
Adjusted R Square	0.358694597							
Standard Error	0.02524502							
Observations	20							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	0.00868468	0.002895	4.542357	0.017395525			
Residual	16	0.01019698	0.000637					
Total	19	0.01888166						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	4.487825637	0.69005606	6.503567	7.28E-06	3.024972139	5.950679	3.02497214	5.950679135
Oil Prices (KWD per barrel) (X)	0.004311301	0.00173154	2.489868	0.024162	0.000640604	0.007982	0.0006406	0.007981998
CPI (2010=100) (X1)	-0.009836319	0.00470386	-2.09112	0.052828	-0.01980805	0.000135	-0.019808	0.000135409
GDP at Market Value (Million KD) (X2)	-1.57276E-05	1.8923E-05	-0.83115	0.41812	-5.5842E-05	2.44E-05	-5.584E-05	2.43867E-05

**Table 5: Autoregression of oil prices (X) and the oil prices X(t-1), X(t-2) and X(t-3)**

<i>Regression Statistics</i>								
Multiple R	0.531514							
R Square	0.282507							
Adjusted R Square	0.116932							
Standard Error	3.173487							
Observations	17							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	51.54996	17.18332	1.706214	0.214783			
Residual	13	130.9233	10.07102					
Total	16	182.4732						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	8.100764	4.931595	1.642625	0.124416	-2.5533	18.75483	-2.5533	18.75483
Lag 1	0.4605	0.274013	1.680576	0.1167	-0.13147	1.05247	-0.13147	1.05247
Lag 2	0.175031	0.301196	0.58112	0.571098	-0.47566	0.825725	-0.47566	0.825725
Lag 3	-0.11717	0.268022	-0.43718	0.669157	-0.6962	0.461853	-0.6962	0.461853

**Table 6: Autoregression of the dependent variable of CPI and the X1(t-1), X1(t-2), and X1(t-3)**

<i>Regression Statistics</i>								
Multiple R	0.984562							
R Square	0.969363							
Adjusted R Square	0.962293							
Standard Error	0.381452							
Observations	17							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	59.8496	19.94987	137.107	4.34E-10			
Residual	13	1.891575	0.145506					
Total	16	61.74118						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-26.6086	7.504231	-3.54581	0.003585	-42.8205	-10.3967	-42.8205	-10.3967
Lag 1	1.004133	0.181106	5.544433	9.47E-05	0.612876	1.395389	0.612876	1.395389
Lag 2	-0.23619	0.268261	-0.88043	0.39461	-0.81573	0.343357	-0.81573	0.343357
Lag 3	0.47172	0.195384	2.414321	0.031236	0.049618	0.893822	0.049618	0.893822



**Table 7: Autoregression of GDP (X2) and the X2(t-1), X2(t-2), and X2(t-3)**

<i>Regression Statistics</i>								
Multiple R	0.752629168							
R Square	0.566450664							
Adjusted R Square	0.466400817							
Standard Error	402.7176247							
Observations	17							
ANOVA	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	3	2754661.188	918220.3959	5.661684468	0.010492			
Residual	13	2108359.308	162181.4852					
Total	16	4863020.495						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-2311.83309	4779.140493	-0.48373407	0.636620963	-12636.5	8012.872	-12636.5	8012.872
Lag 1	0.816151828	0.268218741	3.042859066	0.009428641	0.2367	1.395603	0.2367	1.395603
Lag 2	-0.04813011	0.344561676	-0.13968503	0.891049773	-0.79251	0.69625	-0.79251	0.69625
Lag 3	0.451193749	0.492314125	0.916475328	0.376106151	-0.61239	1.514774	-0.61239	1.514774