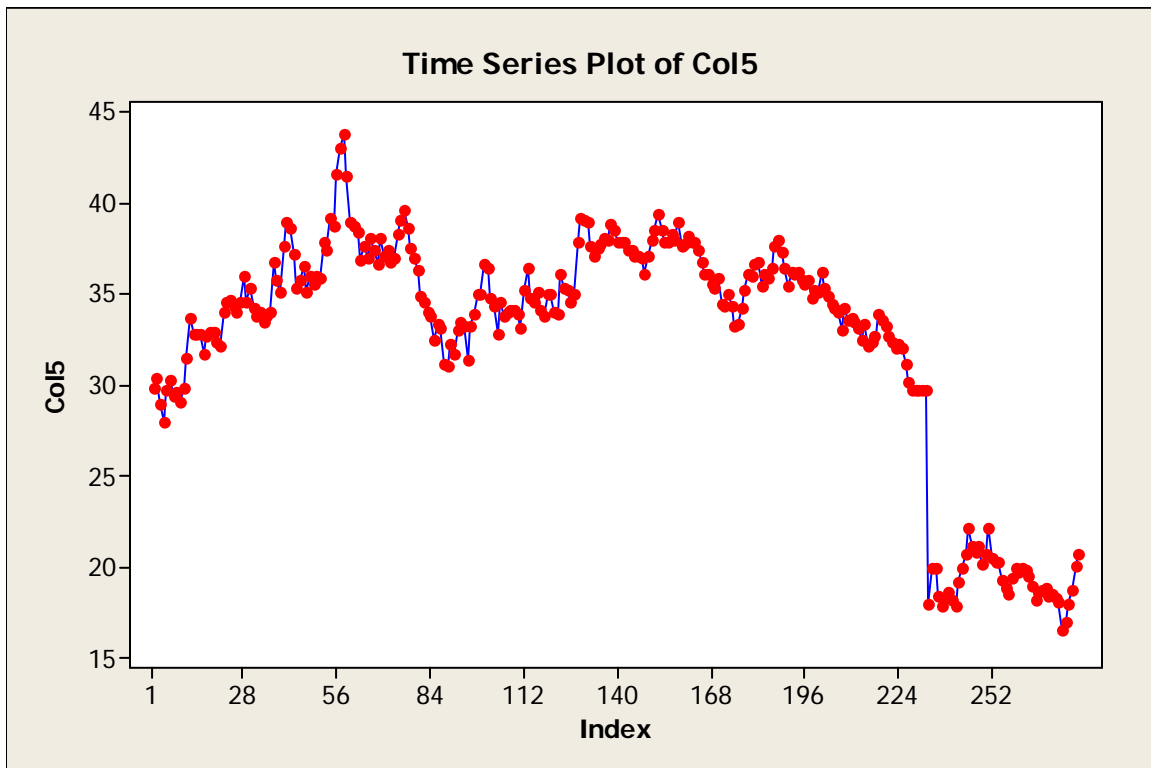


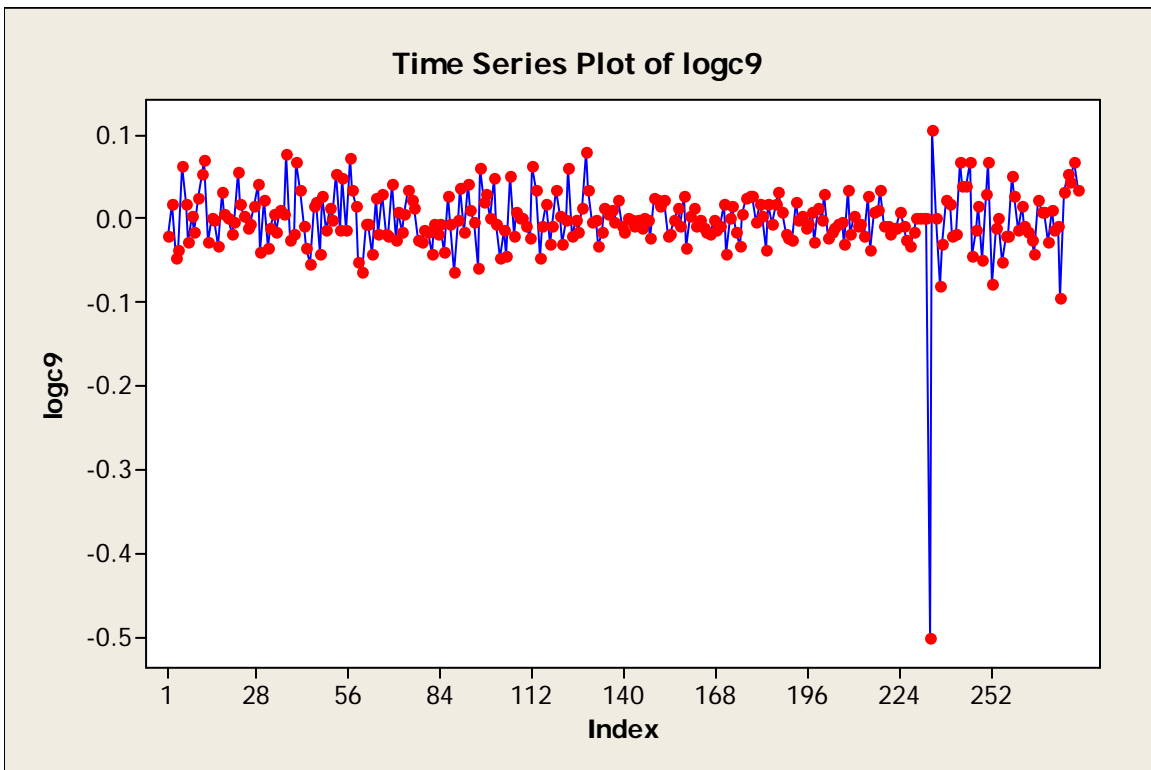
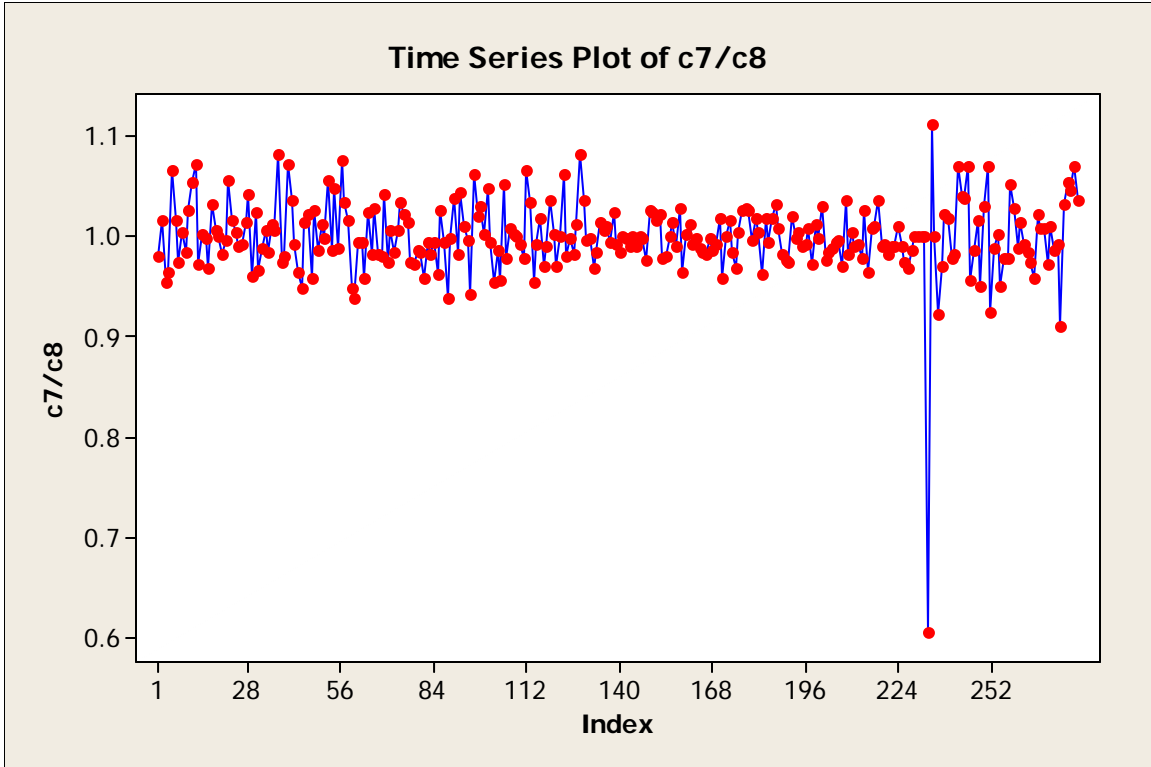
MTB > info

Information on the Worksheet

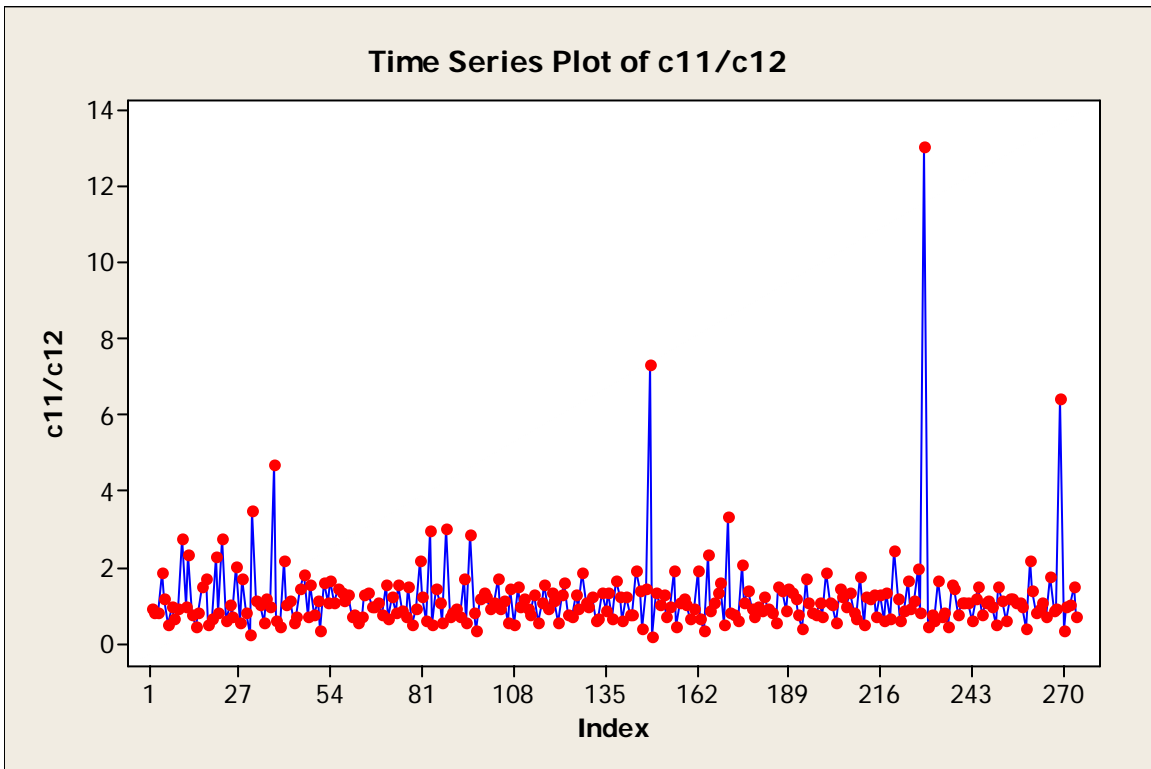
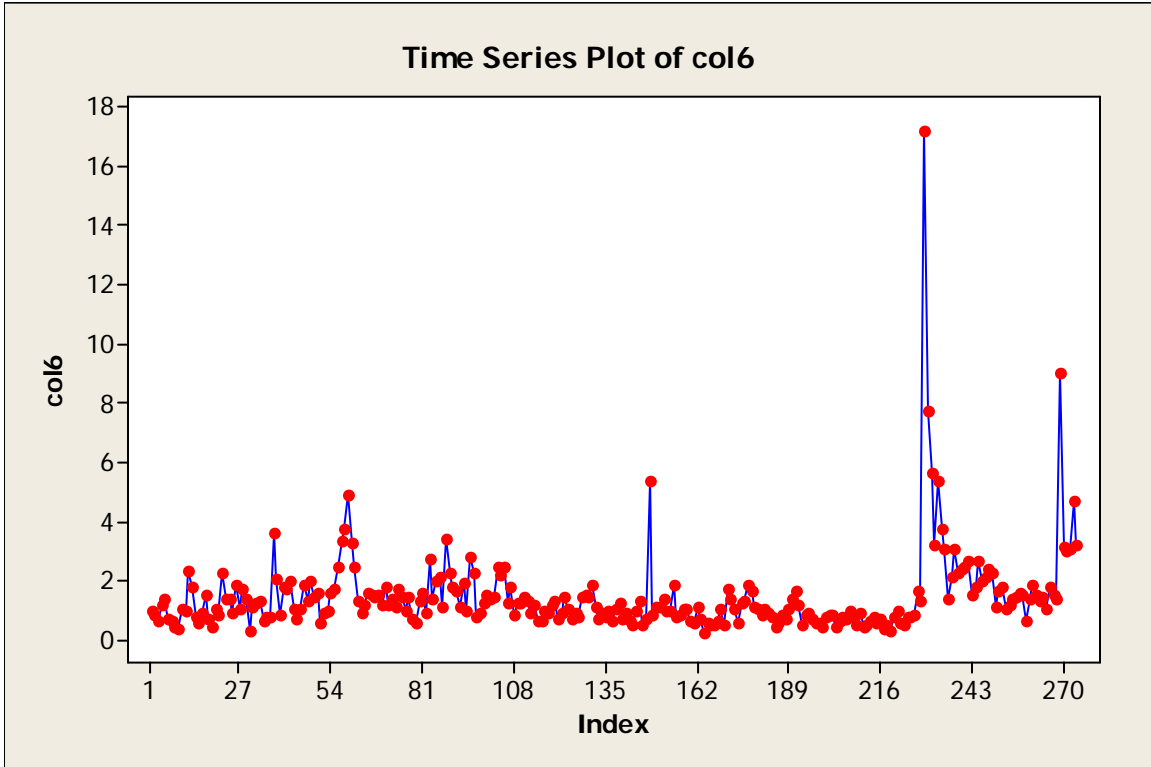
	Column	Count	Missing	Name	
D	C1	279	0	date	
	C2	279	0	open	
	C3	279	0	high	
	C4	279	0	low	
	C5	279	0	close	
	C6	279	4	volume	
	C7	278	0	Col5	(Closing Price Days 2-279)
	C8	278	0	Col5Also	(Closing Price Days 1-278)
	C9	278	0	c7/c8	(Price day i/Price day i-1)
	C10	278	0	logc9	(log(Price day i/Price day i-1))
	C11	274	0	col6	(Vol Days2-279 wo days NYSE closed)
	C12	274	0	col6Also	(Vol Days1-278 wo days NYSE closed)
	C13	274	0	c11/c12	(Vol day i/Vol day i-1)
	C14	274	0	logc13	(log(Vol day i/Vol day i-1))

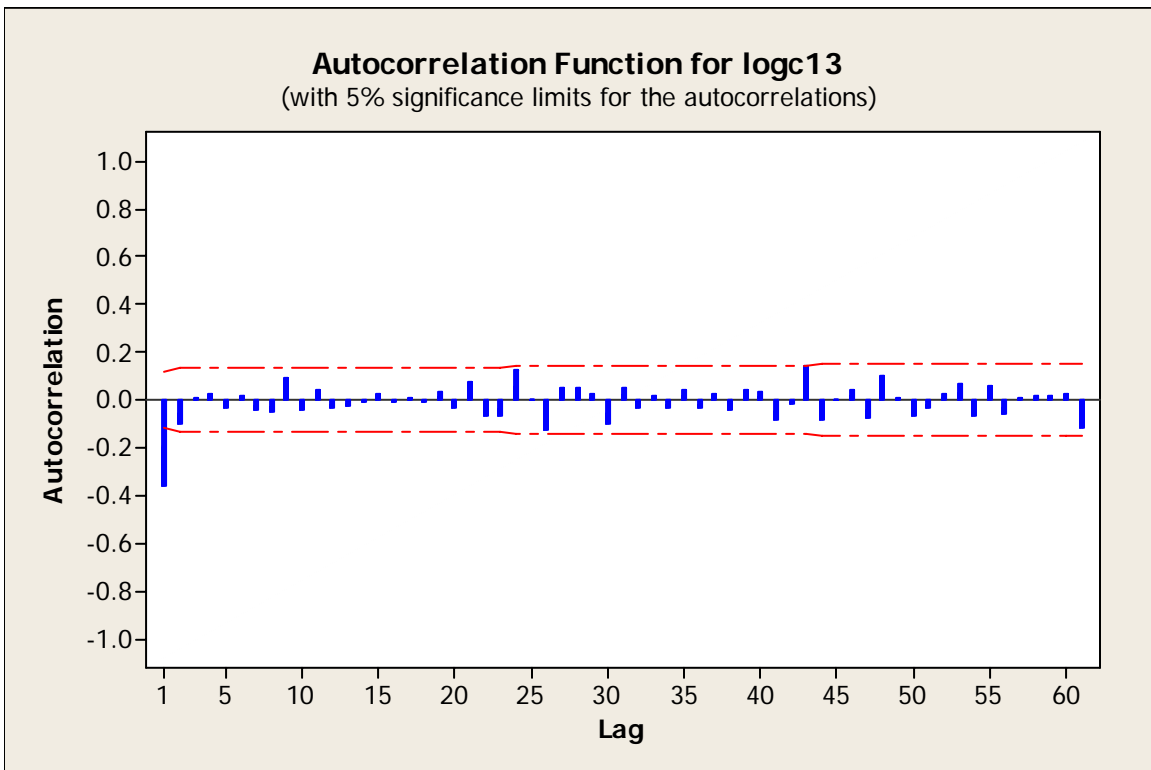
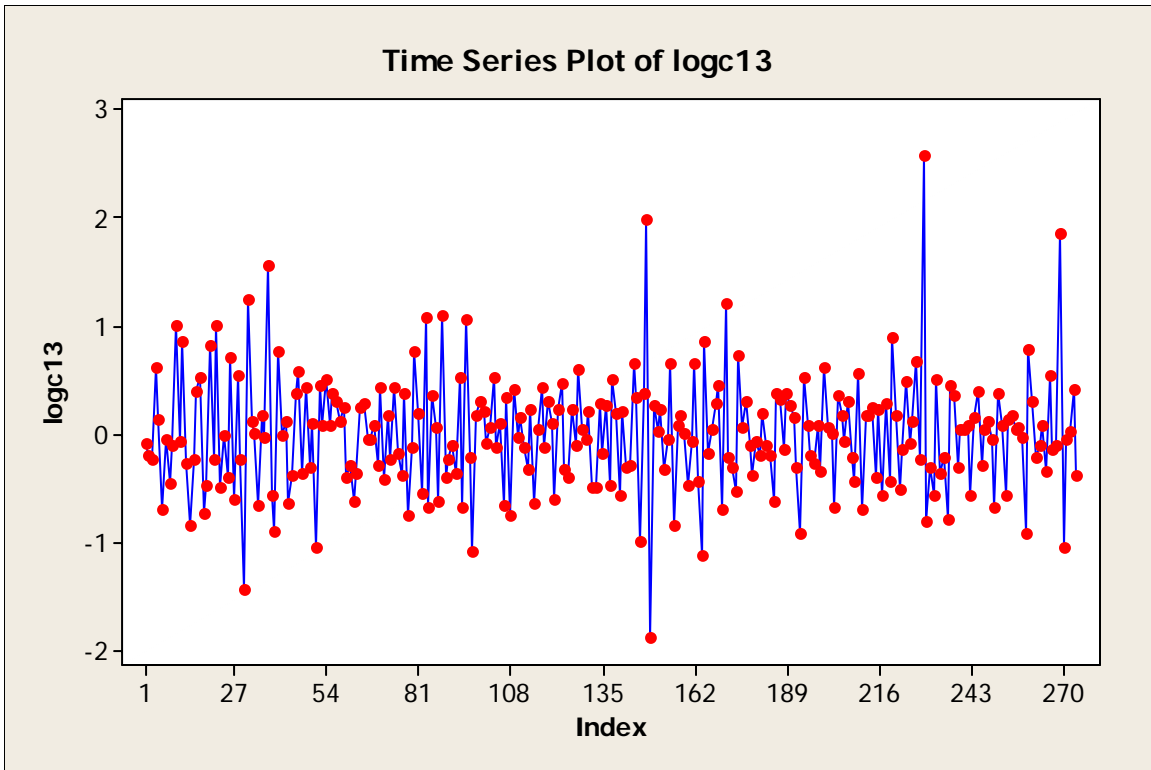
1. Modeling Price at Close (Closing Price)

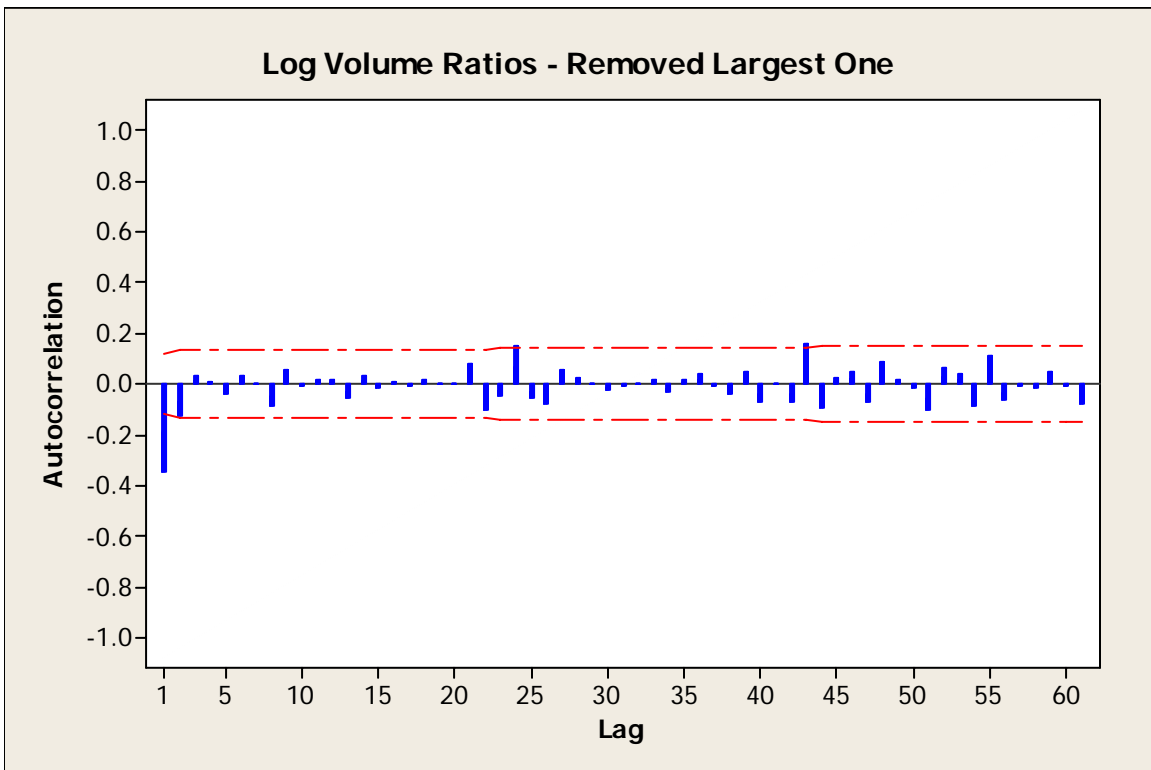
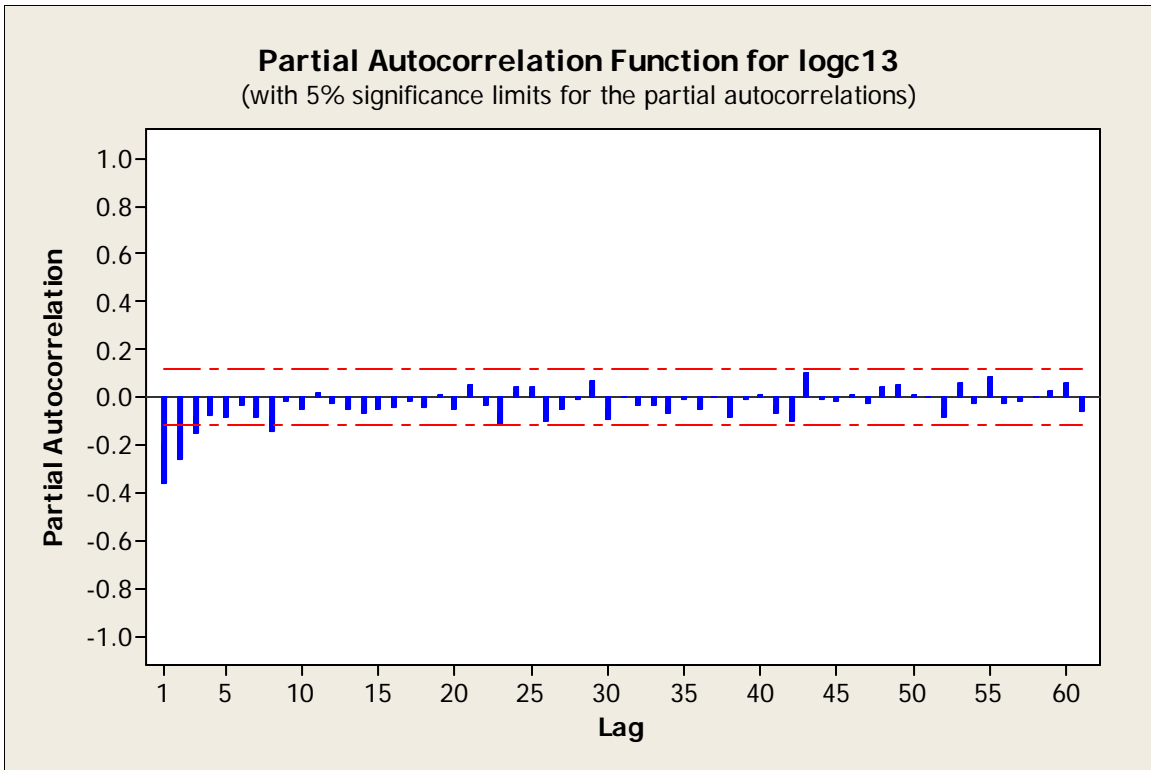


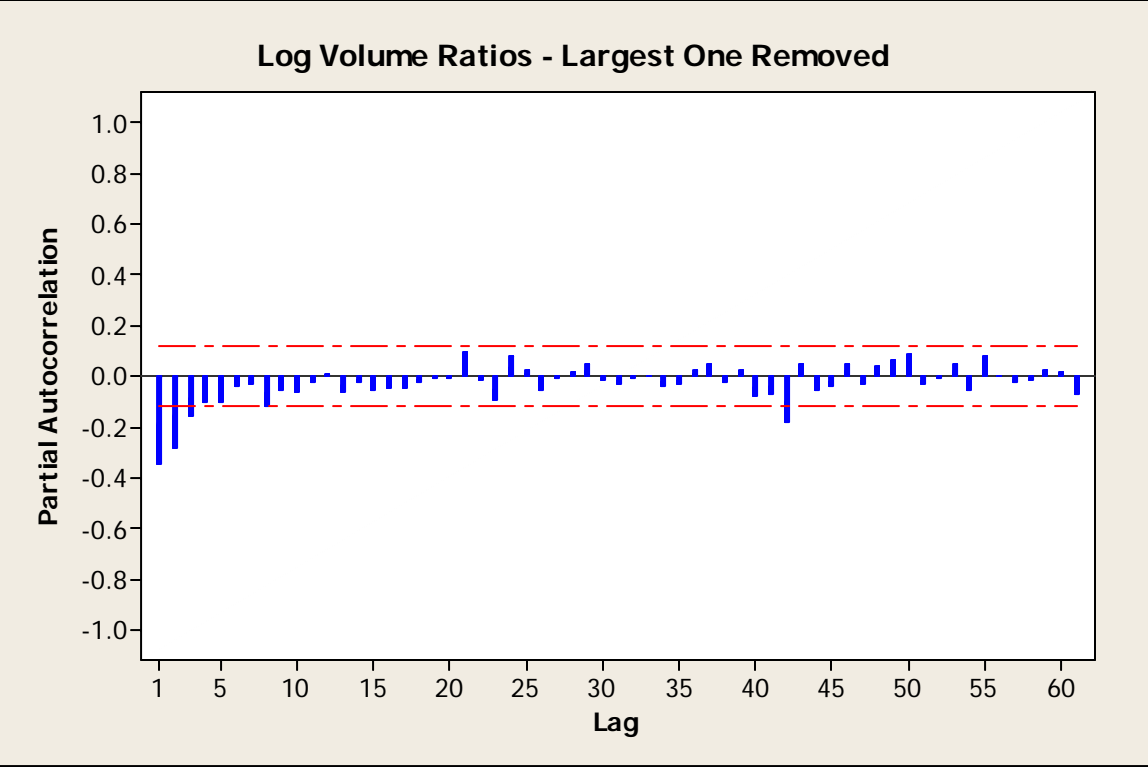


2. Modeling Volume









Fit a MA(1) Model to Log Volume Ratio with Largest Log Volume Ratio Removed

ARIMA Model: logc13

Estimates at each iteration

Iteration	SSE	Parameters	
0	69.8447	0.100	0.095
1	61.9638	0.250	0.031
2	57.7496	0.400	0.002
3	55.6022	0.550	-0.006
4	55.2756	0.604	-0.005
5	55.2294	0.624	-0.005
6	55.2222	0.631	-0.005
7	55.2210	0.634	-0.005
8	55.2208	0.635	-0.005
9	55.2207	0.636	-0.005

Relative change in each estimate less than 0.0010

Final Estimates of Parameters

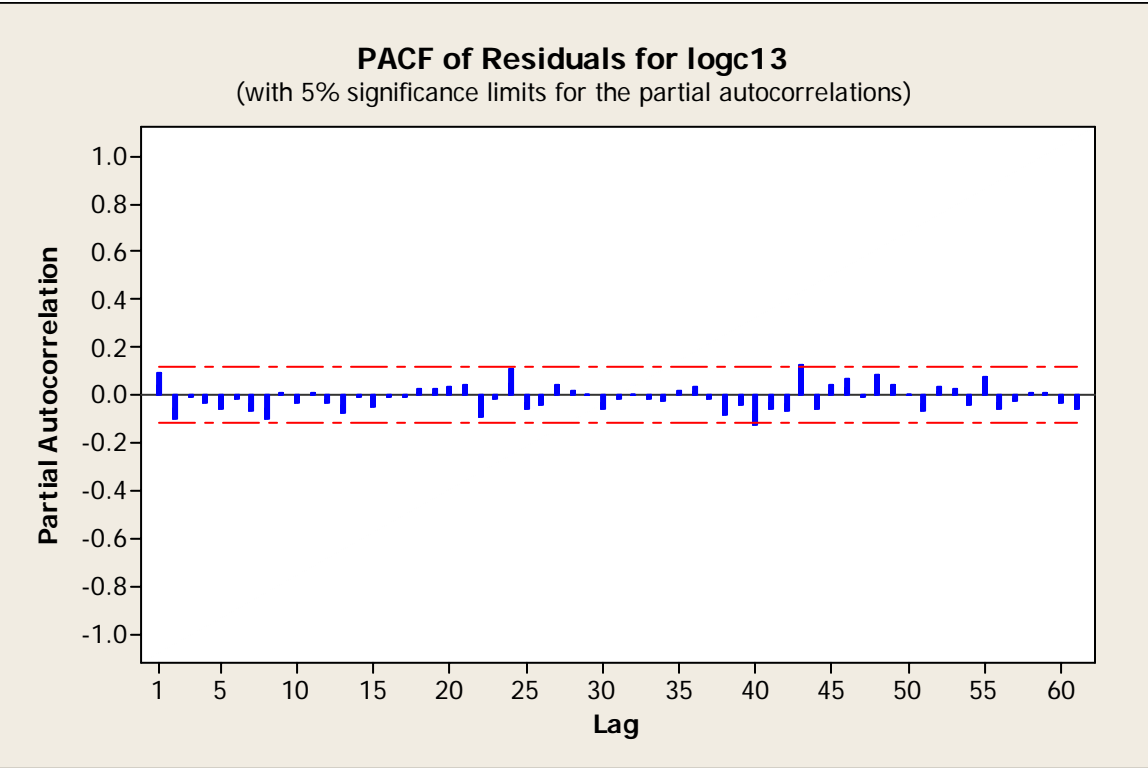
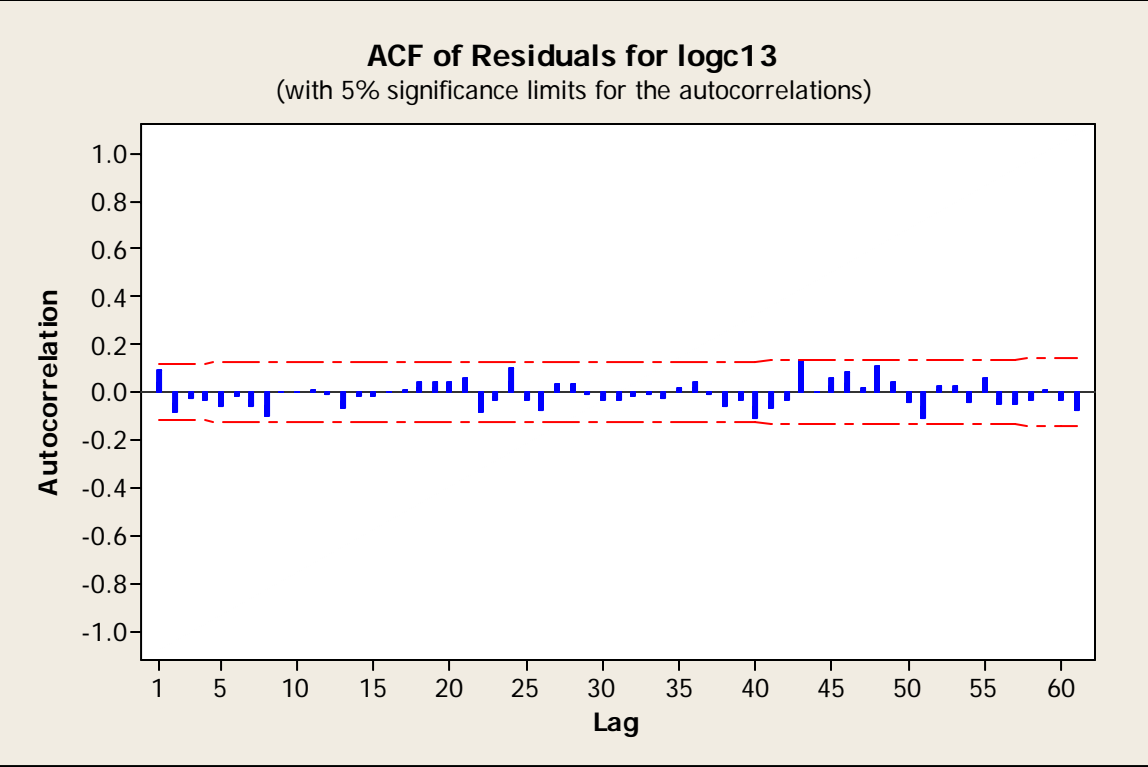
Type	Coef	SE Coef	T	P
MA 1	0.6359	0.0470	13.54	0.000
Constant	-0.004836	0.009970	-0.49	0.628
Mean	-0.004836	0.009970		

Number of observations: 273

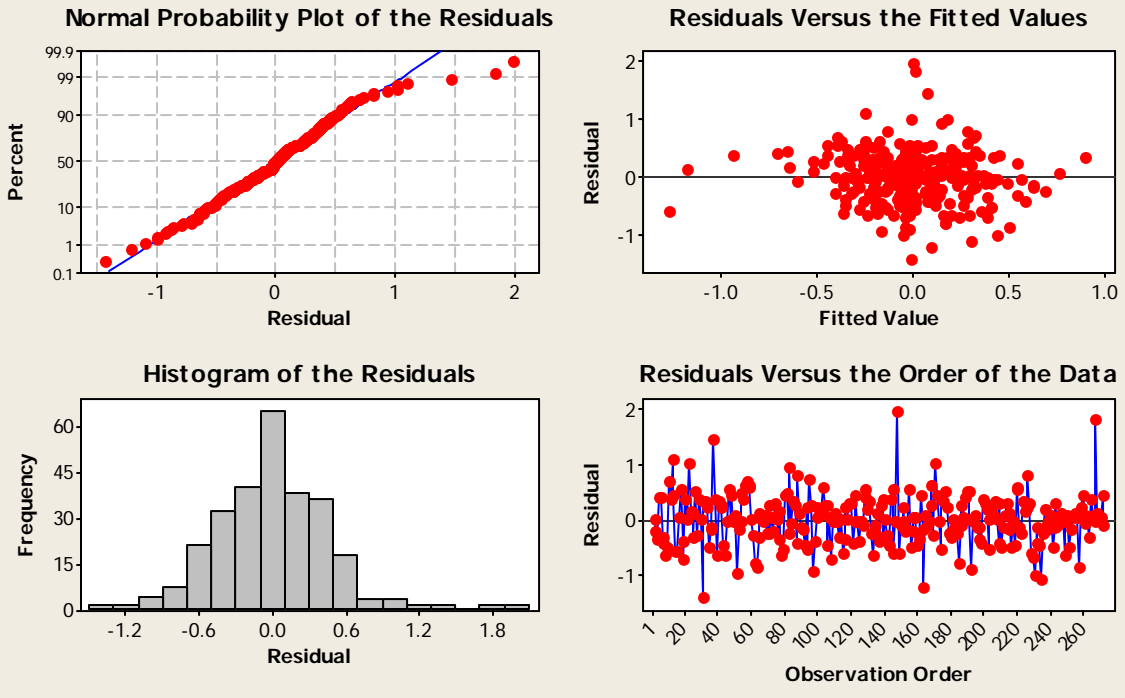
Residuals: SS = 55.2076 (backforecasts excluded)
MS = 0.2037 DF = 271

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

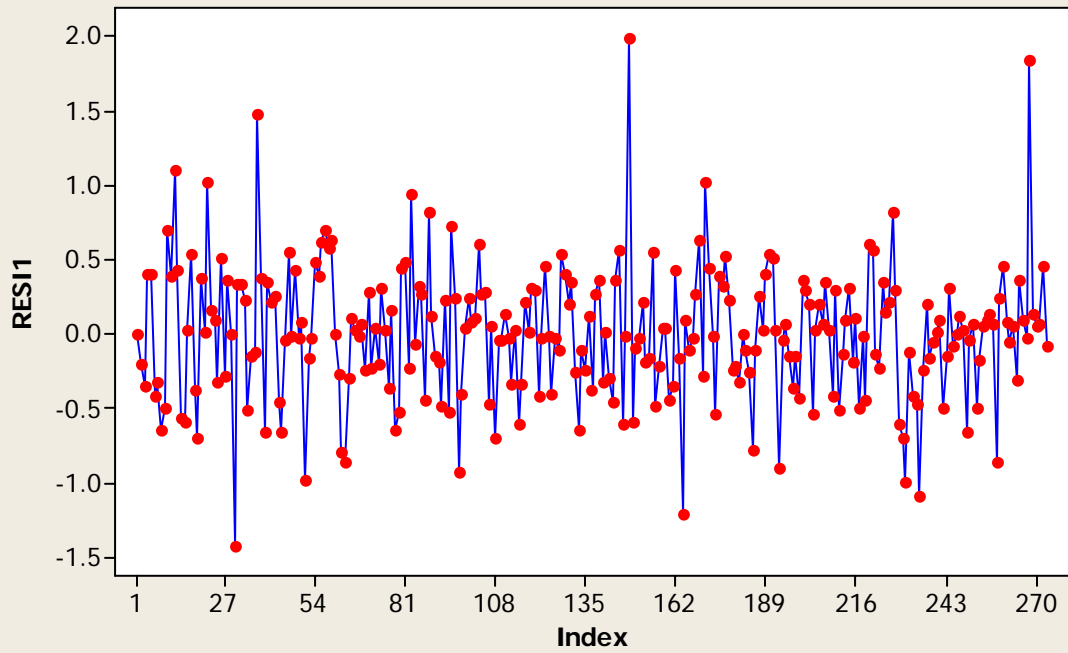
Lag	12	24	36	48
Chi-Square	10.0	19.5	24.1	44.3
DF	10	22	34	46
P-Value	0.442	0.613	0.896	0.545

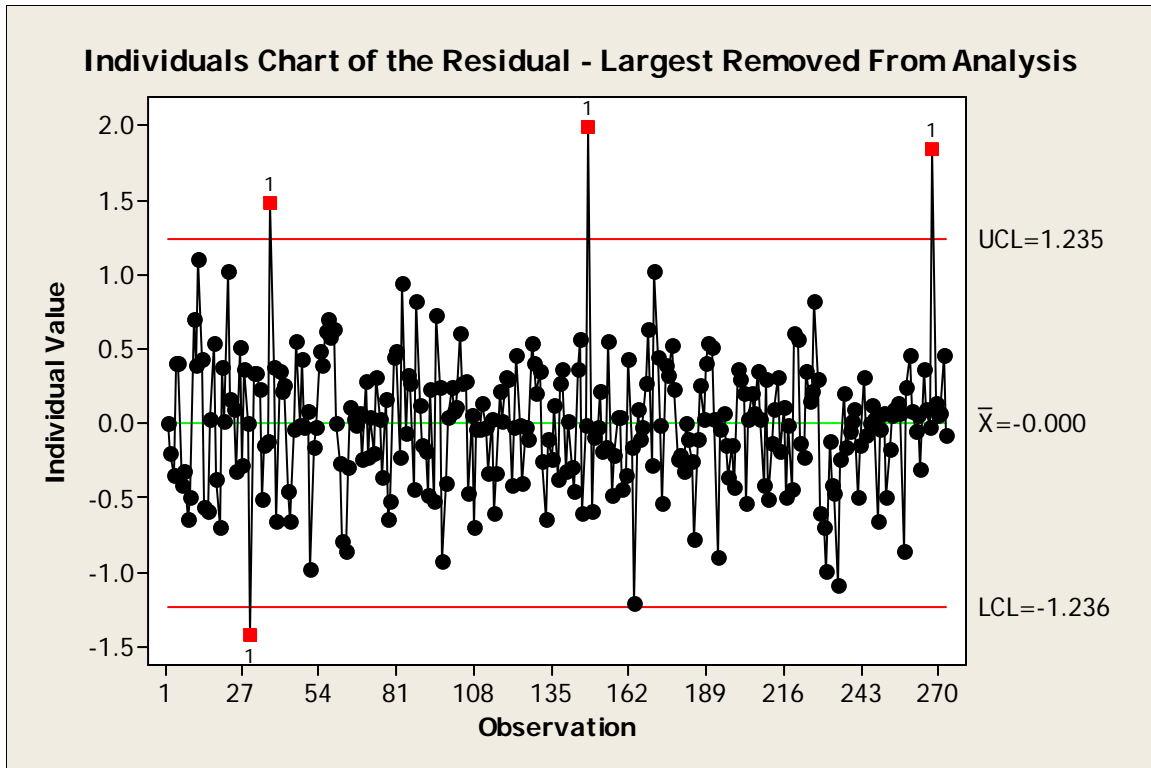


Residual Plots for logc13



Time Series Plot of RESI1





Estimated Residual for the Largest log Vol Ratio 2.56986 is (from (5) on MA(1) on David's Handout) 2.56986-Forecast Estimate where the forecast estimate (FE) is

$$\mu - \theta e_{t-1} \quad \text{where } \mu \text{ is estimated by } 0 \text{ and } \theta \text{ by } 0.635910$$

and

$$e_t = \sum_{j=0}^{\infty} \theta^j (Y_{t-j} - \mu)$$

That is, here

$$FE(t) = -\theta e_{t-1} = -\sum_{j=0}^{\infty} \theta^{j+1} Y_{t-j-1} = -0.176332$$

So the estimated residual for the largest Volume Ratio is $2.56986 + 0.176332 = 2.746192$. Note that this would be way above the upper control limit in our Individuals control chart above.