

*Generalized Roll 03.sas: Trades in MTZ, October, 2005*

Stock Symbol=MTZ Transaction Date=20051003

TIME	PRICE	SIZE	G127	CORR	COND	EX
9:16:53	10.90	17900	0	0	T	T
9:30:56	10.84	3300	40	0		N
9:30:57	10.84	200	0	0		T
9:30:57	10.84	1200	0	0		T
9:30:57	10.84	1500	0	0		M
9:30:57	10.84	100	0	0		T
9:33:55	10.85	300	40	0		N
9:36:19	10.88	100	40	0		N
9:36:55	10.90	100	40	0		N
9:41:59	10.94	200	40	0		N
9:44:15	10.94	100	40	0		N
9:44:16	10.95	400	40	0	E	N
9:44:18	10.95	100	40	0		N
9:44:34	10.96	100	40	0		N
9:44:35	10.95	300	40	0		N
9:44:47	10.95	100	40	0		N
9:45:03	10.98	200	40	0		N
9:45:44	10.95	200	0	0		M
9:47:22	10.99	100	40	0		N
9:47:23	11.00	100	40	0		N
9:48:45	11.00	100	40	0	E	N
9:48:46	11.00	400	40	0	E	N
9:49:25	11.00	200	40	0		N
9:52:24	11.00	100	40	0		N
9:57:42	11.00	200	40	0	E	N
9:58:01	11.00	400	40	0		N
9:58:10	11.00	100	40	0		N
9:58:46	11.00	100	40	0		N
9:58:49	11.01	100	0	0		P
9:59:04	11.01	100	40	0	E	N
9:59:08	11.01	200	40	0		N
9:59:09	11.02	100	40	0		N
10:00:02	11.00	300	40	0		N
10:00:33	11.00	100	40	0		N
10:00:34	11.01	100	40	0		N
10:00:50	11.02	100	40	0		N

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10:02:02	11.02	200	40	0		N
10:02:32	11.02	200	40	0	E	N
10:02:42	11.03	200	0	0		T
10:02:42	11.03	100	0	0		P
10:02:42	11.03	100	0	0		T
10:02:45	11.02	100	40	0		N
10:02:46	11.01	400	40	0		N
10:03:18	11.02	300	40	0		N
10:03:20	11.02	200	40	0	E	N
10:03:46	11.02	100	40	0		N
10:05:22	11.01	300	40	0	E	N
10:06:07	11.01	500	40	0		N
10:06:07	11.01	100	0	0		M
10:06:07	11.01	100	0	0		M
10:06:07	11.01	300	0	0		M
10:06:20	11.01	400	40	0	E	N
10:06:25	10.99	100	40	0		N
10:06:27	10.96	700	40	0		N
10:06:28	11.00	200	0	0		M
10:06:28	10.99	100	40	0		N
10:06:46	10.99	200	40	0		N
10:07:01	10.99	100	40	0		N
10:07:57	10.96	300	40	0	E	N
10:08:33	10.97	100	40	0		N

# Univariate MA analysis of price Input dataset=SASData.ct maOrder=5

## The ARIMA Procedure

Name of Variable = PRICE	
Period(s) of Differencing	1
Mean of Working Series	0
Standard Deviation	0.01039
Number of Observations	14493
Observation(s) eliminated by differencing	1

Autocorrelations				
Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1	Std Error
0	0.00010796	1.00000	*****	0
1	- 0.0000207	- .19183	****	0.0083066
2	8.61165E- 7	0.00798		0.0086068
3	7.24062E- 7	0.00671		0.0086073
4	1.75142E- 6	0.01622		0.0086077
5	2.22009E- 6	0.02056		0.0086098
6	- 4.5624E- 7	- .00423		0.0086132
7	- 9.3226E- 7	- .00864		0.0086133
8	2.16704E- 6	0.02007		0.0086139
9	1.17243E- 6	0.01086		0.0086171
10	- 1.6677E- 6	- .01545		0.0086181

". " marks two standard errors

Inverse Autocorrelations	
Lag	Correlation
1	0.19637   ****
2	0.02555   *
3	- 0.01129
4	- 0.02793   *
5	- 0.02867   *
6	- 0.00427
7	0.00037
8	- 0.02145
9	- 0.01282
10	0.00998

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## The ARIMA Procedure

Partial Autocorrelations																							
Lag	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
1	- 0.19183	****																					
2	- 0.02992	*																					
3	0.00264																						
4	0.01901																						
5	0.02865											*											
6	0.00579																						
7	- 0.00862																						
8	0.01644																						
9	0.01748																						
10	- 0.01040																						

Autocorrelation Check for White Noise									
To Lag	Chi- Square	DF	Pr > ChiSq	Autocorrelations					
6	545.24	6	<.0001	-0.192	0.008	0.007	0.016	0.021	-0.004

Conditional Least Squares Estimation					
Parameter	Estimate	Standard Error	t Value	Approx Pr >  t	Lag
MA1,1	0.19811	0.0083069	23.85	<.0001	1
MA1,2	-0.01023	0.0084684	-1.21	0.2269	2
MA1,3	-0.01005	0.0084694	-1.19	0.2356	3
MA1,4	-0.01992	0.0084695	-2.35	0.0187	4
MA1,5	-0.01933	0.0083103	-2.33	0.0200	5

Variance Estimate	0.000104
Std Error Estimate	0.010189
AIC	-91809.5
SBC	-91771.6
Number of Residuals	14493

\* AIC and SBC do not include log determinant.

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*The ARIMA Procedure*

Correlations of Parameter Estimates					
Parameter	MA1,1	MA1,2	MA1,3	MA1,4	MA1,5
MA1,1	1.000	- 0.196	0.010	0.010	0.024
MA1,2	- 0.196	1.000	- 0.193	0.007	0.009
MA1,3	0.010	- 0.193	1.000	- 0.193	0.010
MA1,4	0.010	0.007	- 0.193	1.000	- 0.194
MA1,5	0.024	0.009	0.010	- 0.194	1.000

Autocorrelation Check of Residuals									
To Lag	Chi- Square	DF	Pr > ChiSq	Autocorrelations					
6	0.39	1	0.5348	- 0.000	- 0.000	0.000	0.001	0.001	- 0.005
12	13.74	7	0.0561	- 0.005	0.022	0.012	- 0.014	- 0.003	- 0.008
18	29.47	13	0.0056	0.001	0.011	- 0.007	- 0.003	0.002	0.030
24	33.24	19	0.0225	- 0.010	0.012	0.001	0.000	0.001	0.005
30	37.00	25	0.0577	0.005	- 0.005	0.011	- 0.003	- 0.000	0.009
36	40.90	31	0.1100	0.005	- 0.003	0.001	- 0.010	- 0.001	0.011
42	50.15	37	0.0731	0.005	0.001	0.003	0.018	0.012	0.011
48	56.68	43	0.0789	- 0.003	0.012	0.005	- 0.015	0.003	- 0.007

Model for variable PRICE	
Data have been centered by subtracting the value	- 0.00005
Period(s) of Differencing	1

*No mean term in this model.*

Moving Average Factors	
Factor 1:	1 - 0.19811 B**(1) + 0.01023 B**(2) + 0.01005 B**(3) + 0.01992 B**(4) + 0.01933 B**(5)

## *Univariate random- walk analysis*

Innovation variance
0.0001038

Thetas				
1	2	3	4	5
- 0.198114	0.0102336	0.0100461	0.019924	0.0193344

Sum of thetas, including theta(0)=1
0.86142

Random- walk variance
0.00007703070681

Random- walk standard deviation
0.00877671389634

Pricing error coefficients				
- 0.13858	0.05954	0.04930	0.03926	0.01933

Pricing error variance (lower bound)
0.0000028126

Pricing error standard deviation (lower bound)
0.001677